GAS JOURNAL, MAY 10, 1939

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Editorial Notes

The Prejudice Factor

THOUGH doubtless many will disagree with the values given by Mr. Anderson to the factors of cost, convenience, and prejudice influencing the choice of competing fuels, the line of thought put forward in this regard in his Paper last Friday to the North of England Gas Managers' Association is highly interesting and merits more than passing consideration. The Author allotted a maximum of five points to each of these factors, and went on to take hypothetical cases. First he compared coal, gas, and electricity in the field of space heating, assuming that the cost value is the same for each source of heat. He then credited five marks each to gas and electricity on the score of convenience, with *nil* to coal, but he placed the prejudice value of coal at five and of gas and electricity nothing. The total number of points in each case was, of course, ten.

Another comparison was between gas and electricity, assuming the same price and convenience factors, but a bias in favour of electricity. The examples are, of course, purely hypothetical, but they do have a significance—that except in considerable differences in cost value, and assuming the same convenience value, the deciding factor is prejudice; and this can be summed up as the degree to which people are coal, gas, and electricity minded. In most cases gas is cheaper than electricity, their relative convenience is about the same, but among certain sections of the public there is a prejudice in favour of electricity because they think that, since it is a comparatively new form of energy, it must give a better and more modern service. This, of course, is quite a wrong idea, and it is incumbent on the Gas Industry to demonstrate the modernity of gas by every means at its disposal. This demonstration, too, must be continuous.

The Gas Industry has plenty of good electrical propaganda to counter. Electricity has made some inroad into the domestic heating field. According to electrical statistics, there are a million electric cookers in use in this country. In other words, one electric cooker to every nine gas cookers. We do not know how many electric water heaters there are installed, but we think there are quite a few. But the Industry's real competitor in the domestic heating field is undoubtedly raw coal. There is an ingrained prejudice in favour of the open fire. The Industry has hardly yet attacked the open fire. Only comparatively recently has gas been offered for space heating at a price which can compete with raw coal, and then only by those undertakings which have put into force two-part tariffs or other attractive systems of charge.

And the Industry appears to have forgotten until recently that it has two smokeless fuels to offer, and that where for one reason or another—and it may not be wholly a matter of price, there are those who prefer solid fuel irrespective of this factor—people cannot be persuaded to substitute gas for coal, there is quite definitely an opportunity for coke. The gas ignited coke burning grate has not been pushed by the Gas Industry in any concerted way, and it seems to us significant that in the fuel comparisons set out in such an interesting manner by Mr. Anderson in his North of England Paper no figures are given for coke, which, properly prepared and graded, is an eminently satisfactory fuel for the open firegrate. Modern gas coke in the modern coke grate scores over coal on cost value and decidedly on convenience value. If it loses on prejudice value, that is solely because the public are unaware of its merits and advantages—and that is the fault of the Gas Industry. We need a great deal more demonstration and propaganda concerning the merits of high-temperature coke and we fail to see why the Industry does not engage in it.

Demand for Smokeless Fuel

MR. ANDERSON, it is true, did mention coke. He stated that the incursion of "patent coke" into the domestic field has had a detrimental reaction on his local coke market, so that about 70% of the coke he makes has to be exported, with consequently a diminished revenue. This in turn means that he cannot supply gas as cheaply as would be possible with a good return on coke. The point we would make is that there *is* a public demand for solid smokeless fuel, and that if the Gas Industry is not prepared to supply this demand, someone else will supply it. We realize that Mr. Anderson is supplying gas in a coal producing area, but we should like to know how the price of gas coke in the area compares with coal and how the price of gas coke compares with that of the "patent coke" which has made such an incursion into the local market—a market where house coal is so cheap.

On the subject of gas sales the Author rightly pointed out

that price alone is not the only factor influencing volume of sales. One must give modern heat service. All the easier, of course, if gas can be supplied at low cost, but the real bulwark of any gas load is the satisfied consumer; and Mr. Anderson has certainly done a great deal to ensure that the public in his area of supply are educated to the merits of modern gas and the advantages of modern gas appliances and that his consumers are given a satisfactory service. He has removed any weak spots in the distribution system. He now has fine showrooms in a main thoroughfare. They were described in the "JOURNAL" of October 6, 1937, at the time they were opened; and Mr. Anderson in his Paper spoke of the "immense value" they have proved in furthering sales efforts. Each man in the Company is encouraged to be a salesman and is paid commission on the appliances he sells. The figures he gave indicate what can be done by a small undertaking as the result of all-round enthusiasm, and there is much in his contention that, provided the small undertakings realize their limitations and unhesitatingly take counsel in specialist matters from those who are specialists, there is strength in personal control and knowledge of local conditions.

Price of Appliances

THERE has been a good deal of discussion recently concerning the price of appliances and the great disparity which exists in the charges to the public made for goods supplied for cash or on hire purchase terms by various undertakings. As we said in the "JOURNAL" last week, it becomes of more and more importance that the great variations in policy and prices between adjacent undertakings should be eliminated. There should be some regional co-operation and an agreed policy generally adopted. It is obviously in the best interests of the Industry to ensure that the terms offered to gas consumers in contiguous areas should be as nearly as possible the same. Why should there be such a wide difference between some undertakings' ideas of a reasonable profit on "fittings account" and the view of those whose policy it is to sell appliances at or below cost to secure the load?

This matter of regional planning was touched upon by Sir David Milne-Watson in his Address at the annual meeting last Wednesday of the South Eastern Gas Corporation. A report of his speech will be found on a later page of to-day's "JOURNAL." He referred to the progress which has been made by the Corporation towards standardization of appliance prices. All companies in the western group adjoining the Gas Light and Coke Company are now selling appliances at the same prices as that Company, while a greater degree of uniformity in the pricing of appliances has been achieved for the companies in Kent and East Sussex. Again, the Corporation has been able to lay down certain general lines in regard to the introduction of two-part tariffs. Although the price at which gas is supplied naturally varies according to the costs of production and distribution, standard types of two-part tariff have been adopted in most of the associated companies for such purposes as central heating and bread baking; and domestic two-part tariffs are being introduced as rapidly as possible. Also affecting appliance sales, standard forms of hire purchase agreement have been drawn up by the Corporation for use by all the constituent undertakings—a further example of the way in which unnecessary differences in practice can be eliminated over a wide area. There is no doubt that holding companies can do much good work towards regional planning.

A Satisfactory Year

THE progress made by the South Eastern Gas Corporation during 1938 can be regarded with satisfaction. In spite of the adverse weather conditions—adverse, that is, from the point of view of gas consumption—taking the constituent undertakings as a whole there was a small increase in the sale of gas; sales of appliances were well maintained, six of the companies showing records; many large-scale central heating orders were gained; and several long-term public lighting contracts were obtained.

On the manufacturing side, Sir David spoke of the progress made in the closing down of small manufacturing units and in affording bulk supply, and he mentioned that four new benzole plants were put to work during the past year and that orders had been placed for three more plants and for the extension of one existing plant. We have discussed the question of the economics of benzole recovery on very many occasions in the "JOURNAL" this year, and we have published many interesting letters on the subject. And amid all this discussion we would call attention to Sir David's statement in his speech that "the production of benzole is a valuable source of extra revenue."

The Severn Valley Gas Corporation, a report of the annual meeting of which will also be found in to-day's "JOURNAL," too, had a satisfactory year in 1938. Major Julian Day, the Chairman, reported that throughout the group of undertakings as a whole sales of gas were fully maintained; and in spite of increased coal costs and operating costs generally a number of the Corporation's undertakings avoided making an increased charge to their consumers, while some actually recorded reductions during 1938 and are now selling gas to domestic users more cheaply than in 1935. Sales of appliances were greater than in preceding years. Again, a number of the companies have adopted two-part tariffs which should make a strong appeal.

Lighting in War Time

AN important publication has just been issued by the Air Raid Precautions Department of the Home Office. It is entitled "War Time Lighting Restrictions for Industrial and Commercial Premises" and is obtainable from H.M. Stationery Office. The restrictions, as were to be anticipated, are drastic. In the event of war a Lighting Order will be issued under emergency legislation imposing general darkening as a permanent condition from the outbreak of war. This Order will deal with all classes of lighting. Street lighting will not be permitted, and the provisions of the Order will call for complete concealment, as a permanent measure, of all artificial lighting inside all buildings.

A great deal of information—and it is all to be had for 2d.—is given on how this art of blackness is to be achieved. In regard to industrial premises, works and factories, the aim is obviously to illuminate nothing but features essential to the safe working of plant. For example, dim lights on pressure gauges in boiler houses are all that is warranted, and even fluorescent paint for indicator dials in general is suggested as an alternative to direct lighting, however dim.

"All premises ought to be in a position to complete their lighting restrictions at a few hours' notice," the booklet urges. Everything possible should be done now; nothing should be left to chance. Darkening may mean that structural alterations will be required. The Home Office asks that any necessary structural alterations shall not be delayed. We are sure that the Gas Industry will not be found wanting in any

national emergency, and we know how well prepared many gas undertakings are to afford service to home and industry in adverse circumstances, how much thought has been given, and how much money has been expended, towards this. As example, we would call attention to the comments made on the subject in the speech of Sir David Milne-Watson at the annual meeting of the South Eastern Gas Corporation, to which reference has already been made. He spoke of the money which has already been expended on A.R.P. by the associated undertakings and of plans ahead. And he also spoke of the practical encouragement given by the Corporation to recruitment of man-power to the fighting Services and of the gratifying and stimulating response.

Coke Research

THE Midland Coke Research Committee has just published its Report of Progress during 1938, and it is a record of a great deal of useful work accomplished. Formed in 1926, the Committee is financed by grants from the users of blast-furnace coke made in the Midlands area, supplemented by a grant from the Department of Scientific and Industrial Research. The properties of coke with respect to its use in blast furnaces and for other metallurgical purposes have been its main concern, but the use of coke for domestic purposes is now also receiving attention. One of the investigations during the year was a large-scale test made at a coke oven plant in which for two days all the coal charged to the ovens was blended with 2% of ground limestone and 0·5% of sodium carbonate. The two alkalis, previously mixed, were fed to the belt conveyor carrying coal to the storage hopper. The mixture was found to be practically uniform in alkali content. The C.A.B. of the coke produced was 0·038—0·015 less than that of the coke made without alkali activation—and the coke gave much readier ignition in an open grate. It could be used in coke grates in sizes up to 2½ in.

This work on alkali activation is very interesting. Fears have, of course, been expressed concerning the effect of the added alkalis on the refractory materials of the retorts or ovens, but the opinion has been put forward by more than one investigator in the field that there is no reason to suppose that the action of the alkali would be more than one of the minor causes of the ultimate failure of the refractories or that it would result in noticeable increases in working costs. It will be recalled that some little time ago Mr. H. H. Thomas explained what was being done by the Liverpool Gas Company on this problem. The long-term experiments being conducted at Liverpool may prove that the fears are unfounded, and we await publication of further results from the experiments. One disadvantage of the process is that it inevitably increases the ash content of the coke, and it is desirable to start with a coal of low ash content. In this regard the report of the Midland Coke Research Committee states that the high ash content of the coke made in the experiment to which we have referred—over 11%—prejudiced the performance of the coke in the open grate and that it would be desirable to reduce the ash content of the coal used below that which normally obtains—namely, 5·5%.

Fuel Testing

A VALUABLE Paper was given recently to the Institute of Fuel by Mr. A. S. Bean and Mr. J. Brown on the fundamental principles and value of fuel testing. As far as the carbonization industries are concerned, no one will deny the need for testing the coals purchased and for carrying out this testing work not once in a while, but constantly. But, as the Authors stressed in their Paper—and as we have emphasized time and again—the results of testing can be nullified unless in the first place the consignments of coal have been properly sampled. The Authors were perfectly right when they said that, by comparison with the worst attempts at sampling, good sampling is expensive, but by comparison of the possible consequences good sampling is cheap and bad sampling very expensive. The use of poor sampling methods is ill-advised. In railway trucks, for example, the coal at the top is conveniently available and is a sore temptation to every would-be sampler. Although this method has done immense harm to the progress of fuel testing, a great deal of it undoubtedly persists.

Here is a quotation from the Paper: "The consumer, above all people, must test his fuels, for he must have the best value for money obtainable. He must ensure suitability of fuel. He must ensure regularity of quality, and that the article demanded is delivered. He must have all possible information, so that within his own organization the fuel is utilized with the highest possible efficiency. He must be aware of the effects of blending various fuels." All of which are good points. But how does it work out in practice at the present time in the Gas Industry?

In the course of the discussion on the Paper Mr. G. M. Gill outlined the testing organization developed by the holding companies with which he is connected—an organization dealing with the testing of some 360,000 tons of coal a year. A central coal testing laboratory was fitted up and adequately staffed. The coals were sampled employing B.S.I. methods and were tested according to prescribed methods. The results were sent to the managers of all the constituent companies using the particular coals tested. The system—it is, of course, still in being—enabled the managers to appreciate what could be expected of the coal on carbonization; it set a sort of standard of what was possible. It also told those who were concerned with buying the coal what was the real value of the different coals. The users could inform the suppliers if the coal was below quality and could give chapter and verse for their complaints. The system formed a basis for the selection of coal. However, with the working of the Coal Selling Schemes gas undertakings cannot now get the types of coal they ask for. The complaint is not so much about price as about the impossibility of obtaining the quality of coal required. As for the cost of this system of testing, Mr. Gill mentioned that it worked out at about 1% of the price of the coal, and the expenditure has proved thoroughly justified by the raised standard of gas-making.

Gas and the B.I.F.

As we go to press we learn of the decision of the Joint Exhibitions Committee that there shall be no organized gas section at Castle Bromwich next year in the sense in which it has become so well known in the past. While no arrangements will be made for a joint display of domestic appliances and manufacturing plant, it is intended to arrange for an industrial gas exhibit on as striking and comprehensive lines as can be achieved.

Time does not permit this week of any comment on the matter, but for a considerable number of years the advantage or otherwise of spending so large a sum annually on one "throw" has been a leading topic in the Gas Industry and a subject of perennial discussion. The arguments for and

against are, therefore, thoroughly familiar to our readers. We do know, however, that the final break has not been decided upon without the most searching enquiry, and the decision has had to be accepted upon the recommendation, as we have stated, of the Exhibitions Committee formed last year under the auspices of the B.G.F., and representing jointly the B.C.G.A. and the S.B.G.I. Since these two bodies know all that there is to be known about the subject and its many ramifications, the verdict must be accepted tranquilly by the Industry, whatever individual feelings may be.

Engineering Public Relations Committee

In 1937, as was mentioned in the "JOURNAL," at the instigation of the Institution of Civil Engineers, an Engineering Public Relations Committee was set up, and among the engineering bodies represented on the Committee is The Institution of Gas Engineers. The aim of the Committee is to present to the public in suitable form information concerning the science and practice of engineering and its services to the public.

An organization has been provided to which the Press can refer for information concerning any item of engineering interest which comes to their notice and has news value, and the Committee co-operates with the B.B.C. and news-reel film companies. Panels of lectures have been organized in various parts of the country and a library of films of engineering interest has been formed for the use of lecturers. Also, exhibits have been prepared illustrating various branches of engineering. The report of the Committee for the year ended March 31 last, which has just been published, shows that the work, which was started in a modest way, has been consolidated and extended. It is recorded that a Sub-Committee for Scotland has been formed and that a considerable increase has taken place in the use made of the services of the Committee by the Press and by individual journalists. In regard to broadcasting, the report mentions that during the year a series of talks on recent inventions and developments was arranged during the year and that the speakers were selected in consultation with the Committee. It is satisfactory that the demand for the service of films and slides is increasing. The activities of the Committee are to be commended. The work of the engineer is taken for granted by the public, which fails to appreciate the responsibility the engineer has to bear and the place he should occupy in the life of the community.

Ammonia and Benzole Recovery

In his Presidential Address to the Western Junior Gas Association (which will be published in a forthcoming issue of the "JOURNAL"), Mr. A. Tran gave a description of the liquor de-ammoniating plant installed at the Reading Gas-Works. The aim of this plant, which is not, we think, widely known, is to reduce the steam consumption, which is a major item in the concentration of ammoniacal liquor, particularly liquor of low strength. Actually at Reading the vertical retort has a strength of only about 8 oz., and the de-ammoniating plant increases the strength to about 13 oz. Mr. Tran stated that the plant has proved very satisfactory in operation. The liquor is brought up to a strength of 20 oz. in a Thorncliffe-Baldurie plant.

Mr. Tran also discussed the question of benzole recovery—a subject which is exercising the minds of many in the Gas Industry at the present time. We like his general approach to the problem. The "anti-benzolites" put forward the argument that already the coke market is flooded and if benzole recovery is further practised still more coke will be piled on to the already overloaded stocks. Mr. Tran agrees with us, however, that the consumption of coke by domestic and industrial consumers has not by any means reached saturation point. The domestic consumer alone is capable of absorbing any extra coke produced as a result of benzole recovery. It is a defeatist attitude to say that no more coke must be produced. Markets still undeveloped are capable of absorbing much more coke than the Gas Industry can supply; and it is just about time that we devoted the same energy and enthusiasm to the sale of solid smokeless fuel as we apply to the selling of gas. We are convinced that there is a great future for coke.

Personal

Presentation to Mr. J. H. Brearley.

Pupils and Assistants who had served him in former years entertained Mr. J. H. Brearley, of Harrogate, to a complimentary dinner at the Great Northern Hotel, Leeds, on Friday, April 28, the "hosts" present being Messrs. H. Singleton (Engineer and General Manager, Huddersfield Corporation), J. W. Brearley (Engineer and Manager, Swinton and Mexborough Gas Board), S. B. Dean (Engineer and Manager, Batley Corporation), T. Dyson (Chief Assistant Engineer, Huddersfield), P. Marsland (Works Manager, Longwood), B. Thorpe (Superintendent, Grimesthorpe Gas-Works, Sheffield), A. Whiteley (Manager and Secretary, Kirkburton, Shelley, and Shepley Gas Company), and J. W. Holroyd (Distribution Superintendent, Rotherham Corporation).

Mr. Brearley entered the Gas Industry on April 26, 1889, at Elland Gas-Works, rising to Assistant to the Engineer and Secretary, the late Robert Porter. In 1896, from 100 applicants, he was appointed Engineer, Manager, and Secretary to the Longwood Gas Company, which post he held for 23 years, during which time the output increased from 36 to 192 million cu.ft., including the amalgamation with Slaithwaite, which took place in 1915. The combined undertaking was bought by Huddersfield Corporation in 1919. At Longwood Mr. Brearley also had considerable consulting practice, which he thereafter continued. He was President of the Manchester District Association in 1906, and of the Eastern Counties Gas Managers' Association in 1918. He was recipient of the "London Gold Medal" in 1907 for his Paper on "The Testing and Hygienic Efficiency of Gas Fires." He is an Honorary Member of the Eastern Counties and also of the Yorkshire Junior Gas Associations.

Following the dinner, Mr. Thorpe presented a gold cigarette case to Mr. Brearley, bearing the inscription: "Presented to Jno. Hy. Brearley, M.Inst.C.E., M.Inst.Gas E., on the completion of 50 years' service in the Gas Industry as a token of respect from his former pupils and assistants: A. Whiteley, J. W. Brearley, H. Singleton, E. Sainter, J. W. Holroyd, T. Dyson, R. H. Duxbury, S. B. Dean, P. Marsland, B. Thorpe."

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Mr. A. E. CHADWICK, Controller of Gas Sales to the Metropolitan Gas Company, of Melbourne, has arrived in this country for a few months' stay.

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On April 26 Mr. J. M. MCLUSKY, Assistant Engineer and Manager of the Wakefield Gaslight Company, was the recipient of a radiogram from the staff and workpeople of the Company on his leaving to take up the position of Engineer and Manager of the Calverley and Horsforth District Gas Company. In the absence of the General Manager (Mr. C. W. Ward), through indisposition, the presentation was made by the Secretary of the Company (Mr. F. Lodge), who paid great tribute to the work of Mr. McLusky during his seven years with the Company and to his pleasing personality. The excellent attendance at the presentation of representatives from every department of the Undertaking testified to the esteem in which Mr. McLusky was held by his colleagues.

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At a meeting on April 28 a presentation was made to Mr. A. P. GHENT, F.C.I.S., Secretary and Accountant of the Dover Gas Company on the occasion of his retirement.

Obituary

We regret to announce the death on Saturday, April 29, of Mr. HARRY MORRIS, Managing Director of the Jersey Gas Light Company, Ltd., in his 65th year. Mr. Morris had been with the Company for 44 years, and his passing has severed a family connexion with the Company of 75 years. A well-known personality in the Gas Industry and the Island, he was connected with a large number of charitable, social, and sporting associations.

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The death has occurred of Mr. J. D. MILLER, aged 84, a Director of the Coatbridge Gas Company for over 30 years.

"GAS JOURNAL" Directory

In order that readers may be able to keep the particulars contained in the "JOURNAL" Directory up to date, we summarize below changes which have occurred during the past month:

Page 22. DOVER. A. P. Ghent, S. & Acct., retired.
" 36. JERSEY. H. Morris, MD., deceased.
" 44. MANSFIELD. J. Gibson, E. & M., retired.
" 52. OSSETT. A. E. Mottram, E. & M., retired.
" 92. PAISLEY. A. S. Nisbet, E. & M., retired.

Letter to the Editor

Smoke and Mechanical Stokers

SIR,—In your report of the discussions at the British Commercial Gas Association's Conference, Alderman Sir Albert Ball, J.P., Chairman of the Nottingham Gas Committee, deplores the fact that in some of our large cities, when gas is found to be a little more expensive than other fuels for furnaces, the people responsible "Go back to mechanical stoking and poison the atmosphere." ("GAS JOURNAL," May 3, page 340.)

This is an injustice to mechanical stokers, and I am sure you would not like any misconceptions to arise from the statement reported in your columns. It is one of the major virtues of the mechanical stoker of any type that it ensures complete combustion. The result is that it is not only economical but it is smokeless, and, in general practice, the suggestion that mechanical stoking poisons the atmosphere is entirely without foundation.

If mechanical stokers are installed correctly and operated correctly, there cannot be any poisoning of the atmosphere, except under some abnormal conditions. If any cases of smoke emission with mechanical stoking can be cited, we should be glad to arrange to have enquiries made into the circumstances, and we do not doubt for one moment that the fault could be remedied.

Yours, &c.,
F. BURLACE TURPIN,
Director.

Automatic Stoker Installations, Ltd.,
36-38, *Victoria Street, S.W.* 1,
May 8, 1939.

Forthcoming Engagements

May.

11.—Midland Juniors.—Annual General Meeting. Address by G. Dixon (Nottingham).
11.—W.G.C.—Annual General Meeting, Gas Industry House, 3 p.m.
13.—Scottish Eastern Juniors.—Annual General Meeting at Edinburgh. Presidential Address of R. Cowie, Jnr. (Hawick).
13.—Yorkshire Juniors.—Meeting at Harrogate. Short Papers by D. C. Gunn, J. W. Stacey, and H. Ramsden.
16.—I.G.E.—Gas Education Executive Committee, 2.30 p.m.
18.—I.G.E.—Joint Committee on Complete Gasification under Pressure, 16, Old Queen Street, S.W. 1.
19.—Southern Association.—Meeting at Devonport.
23.—Southern Association (Eastern District).—Meeting at Gas Industry House, 2.30 p.m. Discussion on "Immersion Heating as Applied to Soft Metal Melting."
25.—Midland Juniors.—Visit to Stratford-on-Avon.
25.—Wales and Monmouthshire Association.—Annual Meeting at Newport.
25-26.—Eastern Counties Association.—Spring Meeting at Grimsby.

June.

6.—I.G.E.—Council, Institution of Civil Engineers, 9.30 a.m.
6, 7, 8, and 9.—I.G.E.—Seventy-Sixth Annual General Meeting, Institution of Civil Engineers.
21.—I.G.E.—Domestic Heating Committee, 2.30 p.m.
24.—London and Southern Juniors.—Summer Visit to Windsor.

Southern Association of Gas Engineers and Managers

Arrangements for Plymouth Meeting.

By kind invitation of the Lord Mayor of Plymouth, Councillor G. Scoble, the Summer Meeting of the Southern Association of Gas Engineers and Managers will be held at Plymouth on Friday, May 19, under the Presidency of Mr. F. Blackburn, A.M.Inst.C.E., A.M.I.Mech.E., Engineer and Manager of the Corporation Gas Department. The day's programme starts at 10.30 a.m., when the Works of the Plymouth Gas Department at Devonport will be open for inspection. At 12.45 p.m. for 1 p.m. there will be lunch at the Royal Hotel, Plymouth, by invitation of the Lord Mayor. At 2.30 p.m. members and their ladies, who are also invited to attend the lunch, will embark on a cruise from Millbay Docks in a "Great Western" steamer, tea being provided. The return to Millbay Docks is timed for 5.30 p.m.

Institution of Gas Engineers

The attention of members of The Institution of Gas Engineers is drawn to an important publication issued by the Air Raid Precautions Department of the Home Office entitled "Air Raid Precautions: War Time Lighting Restrictions for Industrial and Commercial Premises."

Copies of this booklet may be obtained on application to the Secretary of the Institution, 1, Grosvenor Place, London, S.W. 1, price 2½d. each, post free.

The Gas Institute of New Zealand

Annual Meeting

At the 15th Annual Meeting of the Council, held at the offices of the Timaru Gas Company, Ltd., on March 2, the following officers were elected for 1939:

President.—G. H. E. Collins, Auckland.
Vice-President.—R. J. Dunckley, Blenheim.
Hon. Secretary.—G. A. MacFarlane, Christchurch.
Hon. Treasurer.—H. Horrocks, Dunedin.
Members of Council.—F. W. J. Belton, Christchurch; J. H. Grenfell, Oamaru; M. J. Kennedy, Wellington; Jas. Lowe, Auckland; W. B. O'Toole, Invercargill; A. Morrie Taylor, Timaru.
Hon. Auditor.—H. C. Ridley, Christchurch.
Trustee.—John Hungerford, Wellington.

The Secretary reported that the affiliation with the National Gas Association of Australia had been completed.

The next Annual Conference of the Institute was arranged to take place in Auckland during next October.

Wales and Monmouthshire Association

Thirty-Fourth Annual Meeting at Newport

The thirty-fourth annual meeting of members of the Wales and Monmouthshire Association of Gas Engineers and Managers will be held in the Assembly Rooms, Town Hall, Newport (Mon.), on Thursday, May 25, at 11 a.m., when the Chair will be taken by the President, Mr. J. H. Canning, O.B.E., J.P., Director of the Newport (Mon.) Gas Company. Following the Presidential Address, there will be a Paper by Mr. G. M. Gill on "The Management of Small Undertakings" and discussion thereon. At 1.15 p.m. the meeting will adjourn for luncheon at the Westgate Hotel. At 2.45 p.m. members will proceed to Bedwas for an inspection of the coke ovens of the British Benzole and Coal Distillation, Ltd., returning to the Crindau Gas-Works, Newport, to inspect the Jones Oil Gas Plant. Conveyances will be provided as well as tea at the Westgate Hotel on the kind invitation of the Directors of the Newport (Mon.) Gas Company.

Eighth International Road Tar Conference

Delegates from many Continental countries are to attend the Eighth International Road Tar Conference to be held at Brussels on June 24, 1939. At these Annual Conferences, many aspects of the tar treatment of roads are given detailed study. The meetings form a very valuable medium for the exchange of information between the leading technicians of the various countries.

The following Papers will be presented: "The Trend of Modern Road Tar Research and its anticipated influence on Road Practice," by D. W. Parkes, M.C., B.A., B.Sc., F.I.C., the Midland Tar Distillers, Ltd, Oldbury, Birmingham; "Mistakes to be avoided in the Preparation, Storage, and Use of Road Tar," by Monsieur Duriez, France; "The Use of Tar for the Preparation of Rough Motor Road Surfaces on smooth worn Bituminous Coverings, and the Measurement of the Degree of Roughness," by Herr Landesbaurat Grossjohann, Germany.

Association of Tar Distillers

The following were appointed at the Annual General Meeting on April 27 to serve as officers of the Association of Tar Distillers for the ensuing year:

President.—Mr. S. Robinson.
Vice-President.—Lt.-Com. C. A. Buist.
Hon. Treasurer.—Mr. C. E. Carey.
Hon. Auditor.—Mr. E. Hardman.

Represented on the Executive Committee are the Gas Light and Coke Company, City of Leicester Gas Department, Newcastle-upon-Tyne and Gateshead Gas Company, and the South Metropolitan Gas Company.

News of the Week

Notice is Given by the Redditch Gas Company, in pursuance of the Redditch Gas (Charges) Order, 1922, that as from August 12, 1939, the Company will supply gas of a calorific value of 475 B.Th.U. per cu.ft. instead of 500 B.Th.U. as heretofore.

A Number of Very Successful Demonstrations have been held recently throughout the country by Stoves, Ltd. From April 12 to 14 the venue was at Kingsclere, and, from April 17 to 21, at Swindon. In both cases the demonstrator was Miss Hume, of Stoves, Ltd., and the audiences were large and most appreciative.

Increased Gas Prices are to operate in Southport. Sir Ernest Hadfield stated at the Town Council on May 3 that the increase in the scale of charges was due to the increase in production costs, principally by a rise in the price of coal, which had advanced by £14,000 in two years. The increase was in no way due to the cost of the recent inquiry.

The Tender of the Woodall-Duckham Vertical Retort and Oven Construction Company (1920), Ltd., for the reconstruction of No. 2 vertical retort house at the Gas-Works, has been recommended for acceptance by the Birkenhead Gas Committee. The decision is conditional on the receipt by the Committee of satisfactory guarantees or assurances with respect to liability for foundations.

The Import Duties Advisory Committee give notice of an application for an increase in the import duty on mechanical lighter flints and other spark-producing alloys. Any representations which interested parties may desire to make in regard to this application should be addressed in writing to the Secretary, the Import Duties Advisory Committee, Shell-Mex House, Strand, W.C. 2, not later than May 25, 1939.

The Contract for a large coal and manganese ore handling plant for Durban Harbour, to the order of the South African Railways and Harbours Administration, has been awarded to Messrs. Strachan & Henshaw, Ltd., of Bristol. The plant consists of an elevating tippler or dumper to discharge 88 ton double-bogie wagons of the South African Railways at the rate of 30 wagons per hour, and a ship loading quay side transporter of 70 ft. outreach, with a loading capacity of 360 tons per hour. The value of the contract, which was obtained against world competition, exceeds £80,000.

"Only by Carefully Nursing Our Present Plant is it possible to meet the demands of the yearly output of 118½ million cu.ft. of gas," said by Mr. D. A. C. Cruden, a member of Market Harborough Gas Committee, at a meeting of the Urban Council, during a speech which strongly recommended the installation of additional plant. Mr. Cruden pointed out that the present plant was installed in 1922 when the annual output was 44½ million cu.ft. less. The Committee decided to purchase carburetted water gas plant, which could be installed and put into full gas-producing operation at a few hours' notice. It was put forward that to install another vertical type of plant would cost a sum in the region of £16,000, and, in any event, the present accommodation would not permit such a step to be taken.

Sanction of the Ministry of Health is being obtained by the Doncaster Gas Committee to the borrowing of £15,000 to cover estimated capital requirements in respect of mains during the next three years.

Copies of the Undermentioned recently issued British Standard Specification can be obtained from the Secretary of The Institution of Gas Engineers, price 2s. each: No. 847-1939. Cold Rolled Mild Steel Strip for General Engineering Purposes.

Pursuant to Section 9 of the Fenny Stratford Gas Order, 1939, the British Gas Light Company, who control the gas undertaking at Fenny Stratford, give notice that they intend to supply gas of a calorific value of 480 B.Th.U. per cu.ft. as and from June 1, 1939.

Discussion on a Proposal to Increase the Gas Charges in the town by 3d. per 1,000 cu.ft., which was not completed when the time limit of the previous meeting expired, was resumed at a meeting of the Birkenhead Town Council on May 3, when an increase was agreed to.

The Next Meeting of the Members of the Fuel Luncheon Club will take place at the Connaught Rooms, Great Queen Street, Kingsway, W.C. 2, on Thursday, May 18, at 12.40 for 1.10 p.m., when the after luncheon Address on "The Coal Selling Schemes from the Buyer's Standpoint" will be given by Mr. G. M. Gill, M.I.Mech.E. The Chair will be taken by the President, Sir William J. Larke, K.B.E.

Students of the Royal School of Mines, a branch of the Imperial College of Science and Technology, South Kensington, S.W. 7, paid a visit to the Wellington Tube Works, Ltd., Great Bridge, Staffordshire, recently. Intense interest was shown by the students in all the processes of tube manufacture and finishing, which they witnessed, and in a vote of thanks made to the Board of Directors after the luncheon, which followed the tour of inspection, one of the students remarked in particular upon the great care and attention given to the inspection and tests placed upon the finished product.

Excellent Examples of Street Lighting are to be found in St. Helens, where the Gas Department, having received a loan sanction from the Ministry of Health for £5,597, have planned to improve the lighting of 10·35 miles of roadway. Similar schemes, we are informed by Mr. R. L. Greaves, Engineer and General Manager, will follow during the next two years. Instead of erecting steel poles for the lamps, the Gas Department obtained permission to attach brackets to the existing trolley 'bus poles. This arrangement not only saved the Lighting Department the cost of supplying and erecting the poles but helps to keep the footpaths free as well as being more pleasing to the eye. The photographs on this page were taken between 11 and 12 p.m., without any special cleaning of the lamps. They show the installation in Nutgrove Road, the lamps being Foster & Pullen four-light No. 2 size "Arcturus" suspension lamps, with "Staybrite" steel back reflector. The mounting height is 15 ft. and spacing from 62 to 85 ft.

M.o.T. Class "B" Lighting at St. Helens.

A Record Output is reported by Mr. A. E. Ruffhead, Engineer and Manager of the Darlington Gas Department for the year ended March 31. The quantity of gas delivered was 706,150,000 cu.ft., the highest figure in the history of the Corporation Gas Undertaking.

The Results of the South Metropolitan Gas Company's Ambulance Competition for the "Good Samaritan" Trophy held on May 2 were as follows (the teams are given in order of merit): Headquarters, Women Employees, Old Kent Road Works, Phœnix Wharf, Meter Shop, Woolwich Depôt, Rotherhithe, Distribution, and Ordnance Wharf. The judges were Dr. A. C. White-Knox, for the team test, and Dr. M. M. Scott, for the individual test.

A "Novelty Exhibition" is now being held at the Building Centre, 158, New Bond Street, W. 1, and will be open until May 20. The exhibition is the second of its kind organized by the Building Centre and seeks to bring to the notice of architects, builders, and those engaged in the building industry recent developments in the manufacture of equipment and materials. The Committee which has been responsible for organizing the exhibition has included certain material and equipment, which, although not of so recent production, are perhaps not well known to the building industry. There is an impressive array of gas cookers, water heaters, and fires, and it is clear that such a display can have none other than the most beneficial results for the Gas Industry. The Industry is, of course, permanently represented at the Building Centre by its excellent section, with Mr. P. C. Buckle, of the Gas Light and Coke Company, to deal with enquiries.

To Authorize the Company to raise £60,000 further capital by the creation and issue of ordinary or preference shares or stock, or by either of these methods, is the object of a Special Order for which the Barnstaple Gas Company intend to apply to the Board of Trade under Section 1 of the Gas Undertakings Act, 1929.

An Extension of Their Limits of Supply so as to include the parishes of Titsey and Tatsfield in the Rural District of Godstone is the intention of the Croydon Gas Company subject to the approval of the Board of Trade to a Special Order for which the Company intend to apply under the Gas Undertakings Acts, 1920 to 1934.

Members of the Pottery Section of the British Ceramic Society recently paid a visit to the Works of the Stoke-on-Trent Gas Department, where they were welcomed by Mr. A. Mackay, Chief Engineer. After an exhaustive and interesting tour of the plant, the visitors were entertained to light refreshments. Expressing thanks on behalf of the Society, the Chairman, Mr. Tom Simpson, congratulated Mr. Mackay and his staff on their wonderful achievements. Mr. A. E. Hewitt, Chairman of the City Corporation Gas Committee and a Past-President of the Society, fully endorsed Mr. Simpson's remarks and stated that it was entirely due to Mr. Mackay's genius for planning and organization that the works had reached their present high degree of efficiency. Mr. Mackay said he was specially pleased to welcome representatives of the City's staple industry; he hoped that the visit would result in renewed interest being taken in the possibilities and advantages of gas as a fuel for firing pottery.

A.R.P. Notes

Leeds Prepared for any Emergency

The A.R.P. services of the City of Leeds Gas Department were well represented in the two-mile long parade which ended the Leeds Defence Week on Saturday, April 29. Among the party of trained personnel (seventy strong) were many ex-service men, and there was a good display of war medals, including two V.C.'s and other decorations.

During the morning Wing-Commander Hodsell, Inspector-General for A.R.P., inspected the air-raid precautions scheme of the Gas Department, and was very favourably impressed by all that he saw. The Department has completed its plans for ensuring, as far as possible, that in an emergency the Gas-Works would continue to work at full output. The following are among the many steps which have been taken.

At the Meadow Lane Works arrangements have been made to isolate the meter house and benzole plant should they become damaged. The purifiers from the coal gas plant have been connected to those at the water gas plant, requiring 200 yd. of 18 in. main. By so doing, any damage to the coal gas purifiers would not interfere with the gas supply to the district.

Stand-by electrical plant has been installed at both Works at a cost of £3,400.

Additional stocks of gas pipes and main laying equipment to the value of about £8,000 have been accumulated, and reserve stores have been formed in different parts of the distribution area. The normal programme for expansion of the distribution mains has been speeded up considerably. In addition, extra mains have been laid to ensure alternative supplies to all districts; for example, recently 4,300 yd. of 12 in. mains were installed in about three-and-a-half weeks.

Special attention has been given to the protection of the personnel. The shelters include reinforced concrete, each holding fifty men, pill-box shelters at the five holder stations for the attendants and their families, and special small shelters for key men. At the New Wortley Works a 100 yd. tunnel 30 ft. below ground, has been constructed to join up the cellars of the retort house to an existing pit. Full advantage has been taken of suitable underground passages. All shelters are equipped with electric lighting.

Internal communication on the Works between headquarters and the various key positions is done by telephone, and also a loud speaker installation. Practice exercises have been carried out to test the scheme, and in a recent test, after the warning had been given, all personnel were under cover within three minutes.

Here is a section of the attractive stand of R. & A. Main, Ltd., at the *Daily Mail* Ideal Home Exhibition. This firm's comprehensive display was described in our issue for April 19, and a number of the appliances there mentioned will be recognized in the accompanying photograph.

THE SOCIETY OF BRITISH GAS INDUSTRIES

THE PRESIDENT.

Presidential Address

OF

The Rt. Hon. VISCOUNT RIDLEY, C.B.E.

Presented at the Annual General Meeting of the Society held this afternoon at the May Fair Hotel, London.

I have given a good deal of anxious thought to the subject of my Presidential Address. It is often difficult for the President of a Society like this to find a subject which may be expected to be of interest to the members and have some bearing on the industries which they represent, and at the same time be a subject with which the President himself is associated. Fortunately for me, I find on discussing the matter with your Past President, my friend Sir Harold Hartley, there are a good few subjects which he considers would interest the members of this Society and in which I also am interested, and I think all of the points which I intend to touch upon in this Address were suggested to me by him.

My chief interest in these suggested subjects comes through my connexion with two large companies in the North of England, one being in the coke oven industry, and the other one of the largest and most progressive of the provincial gas companies, thus providing me with an interest in the two great branches of the carbonizing industry. The former company also produces refractories for both these sister industries.

I also, in my capacity as Chairman of the Council of King's College, Newcastle-upon-Tyne, keep in touch with industrial research, and perhaps more particularly with the work of the Northern Coke Research Committee, which work, I am sure you all realize, is a matter of great importance to both the coke-oven and Gas Industries.

In this work it has been my pleasure to note the welcome support given by the Gas Light and Coke Company and the South Metropolitan Gas Company, as well as the Newcastle-upon-Tyne and Gateshead Gas Company, in financial assistance and by sending their representatives to take part in the discussions of this Committee.

This research work, coming as it does from laboratory experiment, practical scientific testing and works trials, requires the closest co-operation between university, research committee, and industrial producer and user.

Having heard this account of my association with your industries, you may agree with Sir Harold Hartley that part of my Address might very well be devoted to the subject of co-operation between the gas and coke-oven industries, particularly as regards the disposal of coke and coke-oven gas.

A Close Association.

A mere perusal of the list of members of the Society of British Gas Industries shows how closely the two branches of the carbonizing industry are associated. A great many of the members are, like myself, your President, as much interested in the coke-oven industry as in the Gas Industry. In fact, I venture to think the Society might have been as aptly named the Society of British Carbonizing Industries, thus in its own name suggesting the close connexion between the two industries.

I see in this list the names of several firms who are equally happy in building complete carbonizing plants for both industries, others who will provide gas cooling and condensing plant for both industries, and again, others who are interested in the benzole and sulphate plant requirements of both the coke-oven owners and gas companies. The same dual interest holds good for many of your members who make refractory materials, as well as all those who make for both industries, metering, recording and control instruments, modern aids to efficiency, many of which have only been available in recent years.

It is at once evident how closely the interests of these two great carbonizing industries are interwoven and on what a number of points they have common ground.

In benzole they co-operate in research and the sale of their products, nearly all the important firms in both industries being members of the National Benzole Association and having representatives sitting on the Board. Through a levy on their products they contribute to research on most matters connected with benzole, and the entire output is co-operatively sold through this Association.

As regards tar and pitch, the same co-operation exists; representatives of both industries are on the Pitch Marketing Board and the British Road Tar Association, contributing alike to funds for research and in many cases associating with each other in selling their products.

The same is equally true of their other by-product, sulphate of ammonia. Much the greater part of the sulphate of ammonia made either in the coke-oven industry or the Gas Industry is marketed through the British Sulphate of Ammonia Federation, which in a similar way to the National Benzole Association is governed and controlled by representatives of the two industries. They contribute a portion of their funds to research work, and there is at present a committee, consisting of technical representatives of both industries and Imperial Chemical Industries, Ltd., sitting to consider improvements in the colour and crystal size of sulphate of ammonia, and I believe they have recently succeeded in introducing special selling arrangements for the highest grade of this product.

As regards gas, the chief product of one industry and now the principal by-product of the other, there is of necessity co-operation, because only the gas companies have Parliamentary powers to distribute it.

On the subject of coke, the two carbonizing industries associate quite closely on the research side, both contributing to the funds of the Coke Research Committees and sending their representatives regularly to the meetings, where they confer with the colliery owners, blast furnace managers, and others interested in coke.

Having regard to this widespread unity of interest, it is all the more remarkable that in the important field of coke sales there has been so much less co-operation: in many places none at all. One would think it was equally important to co-operate in the sale of this important product of both industries.

It is true there has been in the last year or two a certain amount of co-operation in this field. This has been more pronounced in the export market in connexion with the International Coke Cartel, which, as a body, has been in very successful operation for about two years and has saved this market from disorganization. Surely the same trouble and care should be devoted to the home market, and what

can be achieved internationally can assuredly be done at home.

In a few of the home districts, Associations are being formed on which representatives of both industries meet and act together, but apart from the very excellent work which has been done by the big London Gas Companies and by the London and Counties Coke Association in London and the Home Counties there has been nothing like the same co-operation as there has been in the other matters in which the two industries are jointly interested.

Need for Co-operation.

The reason for this rather striking state of affairs is more readily understood if we consider briefly the past history of the two industries, and I think it will be apparent that part of this lack of co-operation is due to the fact that the need for it, in coke sales, is not of very long standing.

The industries had, of course, origins which gave little indication of their ultimate relations. The Gas Industry was started to produce lighting for public and domestic use; the coke-oven to produce coke for metallurgical purposes. To the coke-ovens a portion of the gas was of little value and was easily disposed of by burning, often to waste; to the gas works the coke was a product in which they had little interest in the earlier days.

About 30/40 years ago the first tentative contacts were made, one of the most notable being the contract signed by Messrs. Samuelsons, of Middlesbrough, to supply gas to the Middlesbrough Corporation for towns' lighting.

This contact was developed until the quantity of coke-oven gas sold to gas undertakings in the year 1927 was about 5,000 million cu.ft., and increased to 28,000 million cu.ft. in 1937.

In the early days when metallurgical coke was made almost entirely in beehive ovens it was natural and economically sound that owners of coking coal should build their ovens at their collieries and not so often at blast furnaces, although some coke was from the earliest days made in ovens at the blast furnaces. The only by-product in those days was the waste heat, and there was often a better use for it for raising steam at the collieries than elsewhere. It naturally followed that when the owners of those beehive ovens slowly went over to by-product coke making, they should continue to make their coke at the collieries, not only in the case of those owners who were coal owners, but also in the case of composite firms who were coal owners and also had blast furnaces and steel works.

A lot of the ovens in the early days of the by-product industry were waste-heat ovens and not regenerative ovens, as nearly all are to-day, so that there was comparatively little surplus gas. The surplus heat was in the form of so-called waste heat, *i.e.*, red-hot gaseous products which had to be used in boilers built within a few yards of the ovens.

The value of the gas, where there was any, was not appreciated at the steelworks in this country to anything like the same extent that it is to-day, but after the owners of British steelworks had realized to what a large extent the American producers with their modern plants were using natural gas and coke-oven gas, they began to pay more attention to its possibilities.

Gas is now the most valuable by-product of the coke-oven industry, but this was not the case twenty years or so ago, and owners of by-product ovens who only had beehive coke to compete with and were able to get £12/£14 per ton for their sulphate of ammonia, made good profits without utilizing their surplus gas to the fullest advantage. The position is very different to-day, when not only has tar fallen off in value, but sulphate of ammonia is only worth £5/£6 per ton, and the sulphuric acid, which has to be used in making it, costs twice its former price.

The Domestic Coke Market.

It is only natural in these days, when every product has to be utilized to the fullest extent, and the value of coke-oven gas at steelworks for heating melting furnaces and all the auxiliary furnaces, has been finally realized, that a great movement should be made to build new ovens at the steelworks. Consequently some steelworks owners, who previously bought their coke from colliery owners, now make their own coke, and many owners of by-product ovens situated at collieries have lost the market for their coke, in some cases partially and in others almost entirely. They have had this market for a number of years, but they must now go out and find new markets, and are naturally looking to the domestic user and the export trade to take the place of the market they have lost. It is this change of ownership and siting of the ovens that is to a large extent responsible for the present surplus of coking capacity.

After the loss of their coke market many of these colliery owners also contracted with the Gas Companies for regular deliveries of gas, and this contract now forms a very large item in their balance-sheet. The gas contract, however, brings its own liabilities, in that very frequently, in order to fulfil their gas contract, the coke-ovens must produce coke in excess of their immediate commitments. If this coke is not to be sold at cut prices, it must be stocked at the cost of the owner. It is therefore wise for every coke producer for the domestic market to ensure that he has adequate stocking ground and handling facilities so that he may not be forced into weak selling.

The question of the price a Gas Undertaking should pay a coke-works for coke-oven gas is a very vexed one, and I am certainly not going to suggest what the price should be. It will depend to some extent on local circumstances, such as the cost of production to the particular Gas Company which is considering buying it, and its alternative value to the coke-oven company that is producing it. In this respect the information recently given by Dr. E. W. Smith in his Paper, "Alternative Methods of High Temperature Carbonization" on the cost of gas production with various carbonizing systems, is of immense value to both industries. The great difficulty in obtaining costs of this kind is in finding a costing system which is acceptable to all concerned.

One large steel company, which has its own coke ovens, sells its gas to the steelworks on a thermal basis, and for the purpose of internal costing this is charged at approximately 8d. per thousand cu.ft. The same unpurified coke-oven gas is sold to outside steelworks for 8¼d. per thousand cu.ft. That many Sheffield steelworks pay 10d. to 1s. per thousand cu ft. to the Sheffield Gas Company for their gas is sufficient evidence that they consider it an economic price.

Having in mind the present surplus coke-making capacity in the country and threatened over-production of coke, any coke-works owner who contemplates making a gas contract should, if building a new plant, make provision to heat the ovens with producer gas as an alternative to coke-oven gas and be satisfied that he is getting for his surplus coke-oven gas a price high enough to enable him to substitute producer gas for coke-oven gas for heating his ovens. I was glad to note that this point was made by the Authors of the Report on the Gas Industry (PEP). The matter is of more importance at the present time in view of the changed coke position than it used to be.

When, however, there is a surplus of coke, it can be used to make producer gas for heating the ovens and thus reduce the proportion of coke made, in terms of gas sold.

It is difficult to make a reliable estimate as to how much the increasing use of coke oven gas for town supply is responsible for surplus coke.

A Comparison.

Owing to their different aims and methods of working, and to some extent to the different classes of coal used, the amount of gas put into the holder per unit of coke put on to the market varies enormously between the two systems of carbonization. The gas-works may put 15,000 cu.ft. of coal gas into its holder for 9 cwt. of coke put on to the market, whereas the coke works using coke oven gas for heating its ovens only puts the same amount of its surplus gas into the holder for 28 cwt. of coke put on to the market, so under some conditions of supply the coke oven has to dispose of three times as much coke as the gas-works per unit of gas available for sale, that is, when the coke works is specially making gas to deliver to the gas-works.

On the other hand, the coke works may have surplus gas which is being actually wasted or used for firing colliery boilers, for instance. If this gas is delivered instead to the gas-works, the gas-works makes no coke for this proportion of its gas sales instead of the 9 cwt., when it made the gas itself. Of course, if the coke ovens were heated by producer

gas instead of their own coke oven gas, the amount of coke they would have to dispose of would come very much nearer to the gas-works figure, but very few coke works get a high enough average price for their surplus gas to make this practice attractive.

In the above example I have been assuming that the gas-works was only making coal gas. If, as is often the case, they are making water gas as well, the amount of coke they would have for sale would be less, and it is quite possible that in some instances the coke made for sale at the coke ovens might be four-and-a-half times as much as that made at the gas-works.

The condition of the coke market is already giving some concern to those who must sell coke, and the position will be worse when a large number of new ovens which are now being built come into operation, so it is essential that the domestic market should be developed to the fullest possible extent. Statistics have been published calling attention to the fact that there will be in the future, except at times when there is a boom in the steel trade, several million tons per annum of surplus coke or, at any rate, coke-making capacity.

Industrial Planning.

This state of affairs calls attention to the need for industrial planning and if they have not already done so, the people responsible for Political and Economic Planning might pay attention to this field and prepare a Report on the lines of the most excellent one which they have just published on the Gas Industry. This has recently come into my hands and I have not yet digested it, but a very brief skimming of its pages shows what a valuable work it is.

At present if a colliery company has some coking slack or coking smalls and can get a gas contract with some gas company for their surplus coke oven gas, there is nothing to prevent their building a coking plant and butting into the coke market irrespective of whether or not there is surplus coke-making capacity in the district. In the same way, as we have already seen, if a steel company or blast furnace company, which has for a number of years been buying its coke from a coke oven plant at the collieries, decides that it wants coke oven gas in its steelworks, or wishes to make its own coke for its blast furnaces, it need not necessarily stop to consider what is to become of the coke or the plant of the colliery company which has faithfully supplied its needs for many years, although here, again, the steelworks ovens must unload the small coke on to the domestic market.

I mention this here to-day to emphasize once more the need for co-operation between the two carbonizing industries in selling their coke in the domestic market and perhaps with a small hope that industrial planning will some day prevent the building of unnecessary plant.

It is interesting to note here a deviation from the law of supply and demand. Some of this apparently unwanted coke is going to be made for the domestic market, not because there is a present demand for it, as much as because it is thrown on its owner's hands and he has to get rid of it; therefore, the two carbonizing industries must combine, not only in improved methods of marketing their coke, but in devising improved appliances to burn it, and so increasing the demand.

In the way of improvement of design of coke-using apparatus a few of the larger gas companies have done remarkably good work, but with few exceptions the coke oven owners have done little or nothing. I hope that members of the industries who have not hitherto taken an interest in this work will realize the necessity for doing so and will perhaps co-operate with the British Coal Utilisation Research Association. This Association is perhaps unfortunately named, and some people think it has too much interest in the burning of coal and therefore does not look after the interests of coke, but I believe that those in control of it are fully prepared to help and co-operate with all the coke makers.

Displacing Coal.

There is a potential demand for more coke in this market, but not an actual one, and it goes without saying, at any rate, to my present audience, that it is all in the interest of the country as a whole that coke should displace coal in the domestic market so that the valuable by-products of the carbonizing industry are not wasted and the atmosphere is not polluted by the burning of coal in open grates. Even if much further progress were made in the way of burning coal smokelessly in domestic fireplaces there would still be the loss of the by-products.

Both industries must do their part to extend this market. The domestic market was never the close preserve of the Gas Industry. It is only during the last dozen years or so that it has been at all closely cultivated, and then its development in the London district and the Home Counties has been left almost entirely to the large London gas companies and their Association, the London and Counties Coke Association. The gas companies in the provinces, with few exceptions, until very recently have not done any more than several of the coke oven companies. It is at least twelve years since several coke oven owners in the North of England put down special coke screening and coke breaking plant to make coke for the domestic market and did a lot to cultivate this trade by selling carefully graded coke nuts of four or five different sizes in addition to the large coke. They developed a trade in which many of the local gas companies took little interest, being content merely to get rid of their coke, with very little regard to sizing and screening.

Price Regulation.

A regulated price and a definite specification regarding size, ash, moisture content, and freedom from dust would have an immediate and beneficial effect on the domestic market. A steady demand for coke at an economic price would eventually lead to a better coke, with consequent benefits, to the user in less ash and dust, and to the producer in increased demand.

I think both industries will be much too wise when they combine for the purpose of selling coke, as I hope they will, to attempt to exploit the consumer, and that their aim will be to keep coke at as steady a price as possible. The violent fluctuations in the price of coke during recent years are not to the advantage of either supplier or consumer.

In the last three years or so, the price of coke has varied from 16s. to 32s. per ton, and in extreme cases it has been at even lower or indeed higher figures. The coke producer cannot possibly live at the lower range of prices, and at the higher range the domestic user will not continue for very long to use coke. Extreme prices only annoy the customer and lose markets by compelling him to look for alternative fuels, particularly coal, and if once he is driven by the aid of builders, architects, or heating engineers to installing coal-burning appliances, it will be a difficult, if not impossible matter, for the coke owner to regain his market.

The fluctuations in the iron and steel trade and the dependence of the domestic market on climatic conditions will make it no easy matter to maintain a steady price, and some form of voluntary National control is desirable. Such control could only be exercised by a governing body with Nation-wide influence regarding both price and output, for it is obvious that as the domestic market expands there must be considerable quantities of coke transported from North to South, and plants will be operated to suit "all the year round" requirements, and not just immediate demand.

The problems are realized by all interested in the production of coke, and it would be greatly to the credit of the carbonizing industries if they could evolve a really satisfactory arrangement before the Government is compelled to interfere and enforce a less satisfactory one.

Coal Cleaning.

The high ash content of many of our available coals has resulted in the necessary installation of a large number of cleaning plants to reduce the ash content of the coke to a competitive basis. These plants can be divided into two classes, dry and wet processes, and each aims at separating the pure coal from the ash-bearing refuse by reason of their different specific gravities.

In some districts dry cleaning methods are employed using air as the separating medium. These processes are particularly suitable for coals which are dry enough to be screened at fine sizes and which contain little material intermediate in quality between the pure coal and the refuse. They have the great advantage that the products are dry and carbonizing throughputs can be maintained, but great care has to be

taken in the design to ensure that no local dust nuisance is caused by their operation.

Where coals are damp and screening operations difficult, wet washing processes are often used, for the screening can be assisted by water sprays and the resulting fractions cleaned in wash boxes using water as the separating medium. The disadvantage of wet processes has been the formation of troublesome slurry, but in recent years greater attention has been paid to de-dusting the coal prior to washing, and in the latest plants, with the addition of chemical treatment of the water, slurry thickening and filtering plants, the slurry trouble has been largely eliminated.

As would be expected much progress has been made in the development of coal-cleaning processes. In each of those mentioned above, the separation is effected by imparting upward currents to the separating media, air or water, in order to "float" the coal and allow the refuse to sink. In view of the presence of particles of different specific gravities in the raw coal, the adjustment of the separating density by these upward currents has to be a compromise, and it is found that certain inaccuracies occur in the shape of refuse persisting in the cleaned coal and coal escaping with the refuse. It follows that if the raw coal contains a large quantity of intermediate density material, then these errors will be greater.

This difficulty has led to the development of the Density Processes which employ a new technique and are highly efficient. The separating medium used is a suspension of a heavy, ground solid in water and by varying the amounts of solid and water the density of the medium can be adjusted. With this type of process the refuse can be separated from the coal very efficiently and in one known case the contractors guarantee to reduce the ash content of the coal to within 0·1% of its inherent ash with a maximum loss of coal in the refuse of 0·25% by weight of the refuse. With such a process it is possible to obtain almost the theoretical yield of coal at any desired ash content, a point of considerable importance in a year's working of a large plant.

The total cost of cleaning the coal must vary with the capacity of the plant, but an all-round figure of 6d. per ton, excluding the loss of vend which is by far the most serious, may be taken.

Where it is a disadvantage to carbonize wet coal because of the reduction in throughput, dry cleaned coal should be used provided its ash content is satisfactory. Otherwise, wet washed coal would have to be dried, either partially or completely, before use. Thermal drying is an expensive process and it is therefore interesting to note the revival of centrifuging for the reduction of the free moisture of washed coal. This method has recently been developed extensively on the Continent with promising results, and two or three British firms are now installing the improved centrifuges at their coal-cleaning plants.

Coal Utilization and Blending.

The rapidly diminishing quantity of our best coking coals, for example, the Busty Seam in Durham which in many districts has been worked almost to exhaustion, has emphasized the importance of conserving our remaining supplies.

Recent advances in this respect are based on the carbonization of blends of different types of coal of varying coking characteristics without showing any deterioration in the quality of the coke produced. The choice of coals depends to some extent on the carbonizing conditions prevailing at the Works; for instance, a blend producing a coke of good quality when carbonized at high temperatures may produce a coke of inferior quality when carbonized at lower temperatures. The only reliable method of obtaining satisfactory information about a blend of coals on a coking plant is by actual trial in the ovens, when a positive result is obtained; on the other hand, a semi-works scale trial in a small experimental oven gives an indication of the results to be expected in large-scale production.

An instance of the importance attached to blending can be given in a case where coal is transported from South Wales to a works in Cumberland for the purpose of blending with local coals in order to make a satisfactory coke. At a coke works in which I am interested, a blend of at least five different coals is used, and it is no exaggeration to state that about half the tonnage of coal, if carbonized without blending, would produce an inferior coke.

It has also been proved at another works that coals possessing properties which make them unsafe for carbonization in ovens can be suitably blended to overcome this trouble. Perhaps it would be of interest to note that with many coals an improvement in the strength of the coke can be obtained by the addition of a small proportion, usually up to 5%, of very finely ground coke to the coal blend. In one or two instances where the results of this practice have been disappointing it has been found that some of the coals have been unsuitable for the addition of the ground coke or that the coke has not been ground sufficiently fine.

Geographical position makes it difficult for some works to obtain the best possible advantage of blending. For instance, a coke works attached to a colliery where the importation of coal is not a practical proposition because of transport charges may be faced with the carbonizing of a coal or blend containing an excess or deficiency of good coking coal, resulting in a continued waste of this valuable material or the production of inferior coke owing to the lack of it.

It sometimes happens that either a gas-works or steel works with no coal of its own has a better selection of coals at its disposal, and therefore is in the best position to obtain full advantages of blending.

One of the most important requirements for successful blending is the efficiency of the blending plant in obtaining a thorough mixing of the individual coals. The degree of crushing and moisture content are also points which must be considered.

It is therefore necessary to investigate these points in addition to the carbonizing conditions required by the blend before arriving at a conclusion regarding its suitability for carbonization.

Although considerable progress has been made in the blending of coal, it has depended mainly on individual experiments, and no satisfactory method is yet available to assess with certainty the value of coals for blending purposes excepting by actual trial.

I was recently very pleased to learn of the large-scale oven tests of various seams of coal that the Fuel Research Board is carrying out at coke works in different parts of the country, in full co-operation with the technical staffs at these works. After the tests on individual seams have been completed, it is their intention to study the carbonization of various blends. It is pleasing to note that the help of the local Coke Research Committees is being used in studying some of the characteristics of the resulting cokes.

I feel convinced that co-operation of this nature is bound to have beneficial results.

Refractories.

The construction, life, and efficiency of a carbonizing unit depend to a great extent upon the refractories from which it is built. The carbonizing industries, realizing this dependence upon refractories, have always taken a keen interest in their development, and The Institution of Gas Engineers was amongst the first to initiate research and give active support to the British Refractories Research Association. They have reaped the benefit of this interest in that Gas Engineers, and the younger generation in particular, have become refractory-minded and give considerable attention to the choice, behaviour, and care of their refractory materials. This concentration of attention has had its natural outcome in an improved standard of product from the manufacturer and a greatly lengthened life in service.

The modern coke oven plant, constructed of accurately shaped silica bricks, bonded with specially compounded silica cements would appear to have an indefinitely long life. The first "all silica" battery put into production in 1924 has worked continuously since then and is still in excellent condition. It will probably eventually have to be pulled down, through no other reason than obsolescence.

The modern segmental horizontal silica retort, continuous vertical retorts, and intermittent vertical chambers give ever-increasing life as research indicates and counteracts the causes of corrosion, erosion, or disintegration. The greatly increased use of improved spraying cements and the development of a technique for applying them has so extended the life and increased the efficiency of many coke ovens and gas retorts that they would appear, in the eyes of the refractory

producer at least, worthy of being listed as "ancient monuments."

While the user of refractories is thus deriving benefit from the improved products of the maker and the work of the British Refractories Research Association, the maker himself is not in such a happy position. He finds that as a result of the care he has taken in manufacture, his products last longer and the orders for renewals on which he depends to keep his works going now appear very infrequently.

One of the chief troubles of the maker of refractories is the ever-increasing number, size, and complexity of the shapes used in the construction of modern carbonizing units, particularly the coke ovens and intermittent vertical chambers. At one silica brickworks which produces a great proportion of these shapes they have at present in stock over 1,800 steel moulds used in this work alone, and it is not unusual to have 100 of these in use in one day, and in 15 years they have produced 60,000 different shapes.

Many of these large and complex shapes present special problems in moulding, drying, and burning, and in this work Research Associations can be of little use. A knowledge of the safe rate of drying of a cube or slab is of little help when faced with the problem of drying a large block with several re-entrant angles and a large hole in the centre. Moreover, owing to the tight joints demanded in gas-works construction and the repetitive nature of coke oven constructions, these shapes must be made with very little tolerance in size. This very high standard of quality has the natural effect of increasing the number of rejections and the cost of manufacture, a point which is not always appreciated by the user, who sees only the finished product.

There is one more point which I would bring to the attention of this Society. At the same silica works previously referred to, they make 14 sizes and about 50 different sections of the horizontal segmental silica retort. Many of these vary only by $\frac{1}{4}$ in. in size or in the radius of certain corners, but each requires a different set of moulds entailing extra cost, thus providing a notable example of the state of affairs which results from lack of co-operation. These moulds could, without great difficulty, be reduced to quite a small number of sizes and types with essential characteristics, and the Gas Industry would benefit in reduced cost, quicker delivery, and speedier repairs.

I am well aware that the question of standardization of plant presents many practical difficulties, but I am convinced that rapid progress could be made if organized by a body of men such as this Society could provide.

Benzole Recovery.

The importance of benzole as a by-product of the carbonizing industries and its direct connexion with the profitable working of a carbonizing unit is well known. As a result of its valuable properties and popularity as a motor fuel, by far the largest proportion of benzole produced in this country is refined to motor benzole and finds its way into that market.

During the year 1937 the production of motor benzole at coke works amounted to 34·5 million gallons and at gas-works 10 million gallons; a total production of refined motor spirit in Great Britain from coal, coal tar, and shale amounted to 100 million gallons in the same year.

The remainder of the benzole is converted into refined products such as 90's benzole, 90's toluole, xylole, the corresponding pure products, and the naphthas, all of which provide the raw material and requirements of many industries such as dyes, explosives, &c. During 1937 a total of 14·9 million gallons of these refined light oils were produced in Great Britain.

It is not surprising, therefore, that the above-mentioned uses of benzole have ensured an economic market far in excess of the maximum production in our carbonizing industries. In addition, nearly all marketing problems are eliminated by the excellent organization of the National Benzole Company. Under such favourable circumstances it is not surprising that the efficiency of benzole recovery has become a matter of major importance. Much attention has been given to the problem, both in the laboratory and in the works, and the progress made compares favourably with that in any other department of the Industry.

The efficient recovery of benzole has been applied more to the coking industry and the larger units of the gas-works than to the smaller works of the latter, where the quantity of available benzole does not always justify its recovery.

As far as I am aware, with the exception of the few existing beehive ovens, there is not a coke works in this country without its benzole recovery plant. In nearly all cases great importance is attached to this valuable product, and, as a rule, the plants are operated in a highly efficient manner.

Benzole technique has progressed very considerably in recent years as regards its recovery and refinement. The first essential in efficient benzole production is to prevent losses of gas due to leakage, especially in the carbonizing units, which entails the maintenance of the plant in a good state of repair. Leakages can also be reduced considerably by the use of modern instruments which regulate the working pressure of the unit within fine limits. At one or two coke works a regulating main has been installed, which, besides controlling the temperature at the top of the ovens above the coke, maintains an even gas pressure in the ovens during the whole of the carbonizing period, thereby reducing any losses of gas due to pressure to a minimum.

Anticipating Demand.

By contrast with the coke market, which fluctuates both in demand and in price due to such factors as the blast furnace demand, foreign conditions, and the seasonal domestic demand, suppliers of gas are in a position to forecast with fair accuracy the demand for their product for a year, the seasonal fluctuations and even the fluctuations through the week being predictable for any one concern. It is interesting to notice the difference between an undertaking which meets a large industrial demand, and those who have primarily domestic consumers. Broadly speaking, in the former case the demand is more constant throughout the year, and tends to fall off at the week-ends, whereas in the latter case the demand falls off more in the winter and tends to rise over the week-end.

During the last few years the use of gas for industrial purposes has increased very largely, and has become of great importance to the trade. Though generally more expensive on a thermal basis than coal, coke, or oil, it has many advantages such as convenience, ease of control, economies in storage, and labour costs. Incidentally, the increased use of gas for industrial purposes is bound to reduce the amount of smoke from factories and also to assist in providing better and cleaner working conditions.

Competition between gas and electricity has materially removed the monopoly which was enjoyed by the gas companies in the early days, and may be said to have made the various price regulation systems out of date.

The original State control of prices with the object of preventing the exploitation of the public from a monopoly, in exchange for certain privileges, took the form of the maximum price and maximum dividend system, which was later changed to the sliding scale system, so as to introduce an incentive to reduce the price of gas. This system was largely upset in the war by the high cost of coal and in 1920 the basic price system was introduced, under which dividends are controlled by the average and not the highest price to any consumer, thus introducing much more flexibility. Later two-part tariffs and block rates were introduced.

Such a system, however, takes no account of variation of cost of coal and of prices of by-products, which form such an important item in the finances of any gas company.

The electrical industry has been encouraged by the State to develop its supply to the utmost, and has been allowed to introduce high minimum charges and low commodity rates, whereas the control placed on the Gas Industry has never allowed this.

The unremunerative small consumer must be supplied with gas, and it is only by voluntary tariffs that consumption of small domestic consumers can be encouraged.

It is admitted that undertakers would be right economically in imposing a minimum quarterly charge to cover cost of installation and collection, but it is also clear that this would involve an increased charge to a large number of the poorest and smallest consumers of gas who depend on it. Political considerations, therefore, override economic ones, as in some cases they must.

(Concluded on p. 413.)

Training for Industrial Administration

By a Slightly Sceptical Chemist

"The Manager sat in the Manager's Chair,
Engineers, and Accountants, and Salesmen were there,
And many a Chemist and many a fitter,
And a great many more who should have known better,
With many more men of lesser degree—
In sooth a goodly companie;
And they served Mr. (name illegible) *on bended knee.*
Never I wheen was a prouder mien,
Read of in books or dreamt of in dream,
Than the Manager, Lord of the Whole Blooming Scene."

(Fragment, erroneously believed to have been discovered at the back of the library shelves on moving from 28, Grosvenor Gardens to Gas Industry House. Author unknown, but probably not the Rev. Thomas Barham.)

The manager's job, as every junior knows, is as easy as falling off a log. It is necessary to be able to make gas, in more senses than one, before one occupies the managerial chair, but having got there it is only necessary to give orders loudly and decisively in order to attain that happy Nirvana of drawing the salary while others do the work. It would have caused the mouths of many juniors to water had they heard of the Chairman of a highly successful company who spent half his time playing golf and the other half sitting in his office. Probably every junior deems it well within his powers to become a successful manager; only the successful manager knows how difficult it is—but then, everyone knows that his own job is the most difficult and tiresome in the world and the other fellow's both fascinating and simple. It is possibly true that there is a Field Marshal's baton in the knapsack of every private soldier; it is certainly true that every junior, particularly on the works, looks upon the manager's office as his ultimate goal. He sees himself rising from his present position in the laboratory—where his name is mud—or as a junior engineer—where he is less than the dust beneath the foreman's feet—to assistant manager, and then to manager of a small works, and so by a series of remarkable transformations to the General Managership of a large concern. Why is it that so many are called, but so few chosen?

The problem is not only of interest to the juniors, it must be the deep concern of the whole industry. No industry can survive if it is not efficiently managed. The problem of providing efficient management is not so easy as it appears to the junior. It is proposed to consider recent ideas upon this subject with special reference to the Gas Industry in the light of a discussion held by the Institution of Chemical Engineers, at which Dr. E. W. Smith made an interesting contribution, and at the Annual Dinner of the British Chemical Plant Manufacturers' Association, at which Mr. E. V. Evans, now President of the Association of British Chemical Manufacturers, was one of the speakers.

It is useful to take the P.E.P. report on the Gas Industry as a starting point. The Gas Industry contains a large number of undertakings of altogether disproportionate size as will be seen from the table below:

Size of Undertaking. Therms per Year.	Number of Undertakings.	Actual Output. Therms per Year.
		Million.
Above 200 million ..	1 (Gas Light and Coke Co.)	253·8
200–100 „	None	
100– 50 „	2 (South Met. and B'ham)	80 and 75 respectively
50– 40 „	2 (Glasgow and Sheffield)	42 and 41 „
40– 10 „	19	
10– 1 „	156	
Below 1 „	526	
Statutory undertakings	706	

In addition there are 544 non-statutory undertakings making 56,000,000 therms, or 3·5% of the total output of the Industry. There is thus one huge concern which employs a large number of highly skilled administrators in many different departments, sales, accountancy, finance, stores, chemical, engineering, and so forth, there are 23 of quite respectable size, some of them large, these 24 between them making 856·3 million therms per year, or 55% of the total output of the Industry, some of whom employ a number of departmental managers and junior potential administrators. There are 156 undertakings of medium-small size in the larger of which there is room perhaps for a sales manager, a distribution manager (the two possibly combined), a works manager, an accountant or office manager, and an engineer and manager—the engineer not always being the manager, be it noted. In most of these the "manager" takes all responsibility. These undertakings make nearly 31% of the total, so that the first 180 undertakings comprising these in which there is some scope of differentiation of managerial duties and some specialization of duties, account for 86% of the whole output of the Gas Industry. The other 14% of the gas made, consisting in all of 218 million therms annually, is divided among no fewer than 1,070 undertakings, in none of which is there any room for more than the one official.

It has been said, though no positive published evidence exists upon this point, that there are some 900 gas undertakings in which the highest paid official receives less than £400 a year. Yet it will be conceded that from the point of view of the Gas Industry it is quite important that the smaller concerns shall be healthily and efficiently managed. We reach therefore the anomalous position that in the greater part of the gas undertakings of the country one man has to be responsible for all departments and to be an Admirable Crichton, while in the larger undertakings, few in number, there are specialists for every minute activity of the concern; the smaller the undertaking, the more a man should know and the less he is paid.

Commenting upon this general situation, the P.E.P. report declares that the existence of so large a number of small undertakings is a source of weakness because: "In considering methods of improving the organization and commercial activity of the Industry . . . personal efficiency throughout the Industry is the first requisite, without which no success can be achieved. It must be remembered that there is strong competition throughout British industry for good personnel . . . for men capable of filling higher technical and administrative posts." A little later the report says: "Measures for recruitment of high-grade technical and administrative staff have been somewhat neglected by the Gas Industry. . . . The success of recruiting will eventually depend on the prospects offered by the Industry. At present, owing to the comparatively small number of large undertakings, there are very few opportunities for first-class men which give scope and due reward for their abilities."

A Suggested Method of Meeting Defect.

The suggested method of meeting this defect is that companies should be grouped to a greater extent so that the services of highly qualified men should be spread over the administration of a much larger area, and an increase in salary levels, so that the Gas Industry should be brought on to the same level as other industries—*e.g.*, the chemical and electrical industries. It is pointed out that the employment of better paid and better qualified men would be a paying proposition because these highly qualified men could displace others now responsible for too many mixed duties, and the real increase that would be secured in the commercial efficiency of the Industry should so increase consumption and economic strength as to counterbalance the greater initial expenditure. There are many reasons for being sceptical regarding grouping, not the least of which is the tendency to purchase at famine prices and so to over-capitalize the undertaking purchased until it cannot show a profit. The services of the outside expert, too, are not always an unmixed blessing. They are like calling in a consultant to advise—there is no assurance that the advice will be good, or that it will be followed, and in any event a high price is often charged for the services of these regional experts, so that the last state of the concern is worse than the first. The results of grouping by present methods have not been uniformly happy, and it appears to the Sceptical Chemist that the Industry as a whole should take the P.E.P. report to heart and should endeavour to formulate some scheme for planned grouping that does not involve purchase of the undertakings by holding companies.

It is impossible to induce ambitious men to enter an Industry in which the great majority of the companies cannot offer salaries much greater than those of a foreman, and it seems inevitable that the Industry must start to plan at the bottom. It is also probable that many of those now languishing in the obscurity of the 1,100 microcosmic companies will desire to make headway into the larger ones. There are thus the two problems facing the Gas Industry: (1) How can the men now in the Industry gain advancement, and (2) how can the Industry select and train men for the higher managerial posts?

The two discussions that have been already mentioned did not deal with the Gas Industry specifically, but with the kindred problems of training for administration in chemical and engineering works. It is well to summarize the general trend of these discussions because of the light thereby thrown upon principles. It has been pointed out that British industry in the last century, and indeed until quite recently, found its leaders by instinct. Geniuses in the industrial field arose, men like Stephenson, Mond,

Tyrer, Brunner, Perkin, Lever, Hadfield, Murdoch, Messel, and many another, who built up great businesses out of small beginnings. These men had no training in industrial management or administration, but they made their way by force of personality and hard work. They lived, however, in a different age, an age where individualism counted for much, and in an expanding market wherein he who dared put his fortunes to the test oft found his argosies come home to port richly laden. The supply of these geniuses is unequal to the demands of business to-day, and we must make shift to get trained personnel both for the higher posts and for the staff work without which the General to-day is powerless. How are we to get them?

Mr. E. V. Evans, taking the older view, the view based on his own experience, says in effect: Select while young those who are likely to make administrators, throw them into the cold water of industrial rough and tumble, and let them swim if they can. When they come to the surface, if still alive, they are administrators. Mr. Evans, of course, is an outstanding example of one who swam. He belies Dr. E. W. Smith's dictum that the chemist as such makes a poor administrator because he has to be exact and responsible for detail and thus cannot accustom himself to taking short cuts based on insufficient proof that falls short of "cast-iron" quality. Dr. Smith is also an exponent of the "sink-or-swim" school; his method appears to be to give everybody in the organization a chance to develop leadership and initiative by giving them as much responsibility as possible. Successes are the subject of praise, failures are not the subject of blame, and the young man is led imperceptibly to believe in himself and to become accustomed to shouldering responsibility. This school believes that administration is a matter of personality, a "flair" for the work, though pains must be taken to discover who has the necessary qualities and who has not.

The present writer, having been—he hopes successfully—through the sink-or-swim process (as a chemist he would prefer to call it "float-and-sink"), has a good deal of sympathy with that school. The outcome of the process is that the managers of the future become very much men of the world in the best sense of the term. They can mix with all sorts and conditions of men, they have worked with the workmen, they have sold in the market-places, they have dined with the Great, they have spoken with the ladies, and some of them have still come out of the industrial cesspool in the condition of Sir Galahad, whose "strength was as the strength of ten because his heart was pure." Such men have experience with a capital "E" and are not easily caught napping.

Power to Become Good Managers.

There are examples within the Gas Industry which show that the power to become good managers is not confined to any one profession. There are chemists, there are engineers, there are financial men, and there are lawyers; these men hold High Office and are a credit to the Gas Industry. Advancement in administration is not necessarily the perquisite of the engineer—not even of the gas engineer—it goes to men with qualities quite other than proficiency in technical matters. The Sceptical Chemist roundly declares, however, that if these with proficiency in technical matters can gain the necessary Experience (still with the capital "E") and develop the required personality, they will make much better managers than those who know nothing about the industry they serve. There has been a curious movement of late in certain directions to put people in charge of industrial organizations who come from quite other spheres on the ground that they have no preconceived ideas. That is, of course, the practice of Governments, the principle on which Cabinet Ministers seem to be selected, and it cannot be held to be an unqualified success.

Firms can assist greatly in the process of qualification for higher positions in the administrative field, but here, unfortunately, it is commonly held that only the larger companies can be of real assistance. If a young man shows ambition—as most of young men do—and the capacity for administration—as many fewer do—he can be moved from department to department to widen his experience until in time he has seen all that is done throughout the whole concern. It is not quite true to say that this type of training can only be secured in the large concerns. In the smaller concerns it is impossible to avoid it, because even the junior assistant cannot avoid being thrown in contact with every problem that arises. The opportunities for such experience are rare in the large concerns, and it is more usual—especially in the Gas Industry—for the young man to be told to stick to his job and not to concern himself with what others are doing. That was the writer's experience in his younger days—and he never forgot it; he took care not to repeat the mistake with his own staff. For this reason the writer might maintain that the young man entering industry should always keep away from the big concerns. But there is just one snag, and it is an important one; the managers of the smaller concerns are not themselves sufficiently trained to give in turn training to those who aspire to rise to the top—training of that type cannot be got usually outside the fifty or so largest companies. The Education syllabuses of The Institution of Gas Engineers do not touch this problem of training for administration, more's the pity!

The question then arises, what is to be done for the young man who wishes to rise to be a manager, but who has not succeeded in being selected for special training? The fact that he has not caught the eye of someone over him, perhaps so far over him that he is seen only as a speck on the ground far beneath one whose head is held high, may not mean that he will not rise. There are many reasons why advancement is not thrust upon the junior. He may be doing quite a good job of work and his seniors may not want to lose him. There may even be jealousy in the minds of older men now above him who believe that their own advancement may depend on keeping a potentially better man down. Whatever may be the cause of non-selection, the ambitious young man will not allow himself to be daunted by that fact, but will desire to use his own efforts. He will build unto himself wings, but he will want guidance as to the design of the wings and the material out of which they are built. He does not wish to crash like Icarus.

Shall we then advise him to be an engineer? Heavens, no. Shall we advise him to be a chemist? As well advise him to commit hari-hari on the tomb of his murdered ambition, unless, of course, he wishes to enter the chemical industry where chemists are appreciated. The Sceptical Chemist, perhaps with his tongue in his cheek, would plump for the law. It is surprising how many barristers achieve high positions in industry if their ambitions tend that way. One can be called to the Bar with much less technical drudgery than is necessary to become a member of the engineering institutions, and that leaves more time for the study of administration. Quite seriously, however, the fact is that in the present constitution of the Gas Industry the terms "engineer and manager" frequently go together, for the elementary reason that at least 1,200 gas concerns cannot afford to pay both an engineer and a manager. That is a pity, because the engineer is not necessarily and by virtue of his profession a good manager. He may control a staff of workmen and operate a works, but that is different from managing a concern. When the Gas Industry is grouped, if ever, the Sceptical Chemist is sceptical of this order persisting. In how many of the holding companies is the function of General Manager performed by a Chartered Gas Engineer? It may even be that an accountant or a supersalesman may be the stepping stone to the manager's office in the future.

Objective of this Homily.

The objective of this homily is to call attention to the fact that there is a very definite school of thought that does not subscribe to the view that the functions of management are different from those of the technical staff in that one is born and the other acquired. Mr. Byng pointed out that the functions of management include:

(1) Selection and control of staff.
(2) Determination of the economic methods of meeting specified requirements.
(3) Definition of the standards to be adopted.
(4) Keeping down engineering costs to the lowest level consistent with the maintenance of the standard of the product and services.
(5) Planning for future requirements.
(6) Collaboration with production, sales, and finance departments in framing and carrying out manufacturing programmes.
(7) Advice on guarantees to customers and the handling of complaints.

Among the outstanding virtues of the administrator are initiative, sound judgment, a delicate sense of justice, the power of leadership, a sound knowledge of the technique of industrial administration, courage without recklessness, and a sense of humour. Mr. Byng points that the managing director needs in his work 90% of administration and only 10% of technology or trade knowledge, and the General Manager needs these qualities in the proportion of 75 : 25. The prime function of the managing director is to keep everyone happy—and that no doubt explains why the really successful managing directors play golf every afternoon.

This school of thought insists that industrial administration can be acquired by study. It is not suggested that experience is not valuable, but it is to them obvious that just as no one would start on a technical career without knowledge of the fundamentals of his subject, so no one should start out to be an administrator without studying what can be described as the groundwork of the subject. The importance is that even those in the smaller works who have not the opportunity of seeing first-class administrators at work can combine the more limited practical knowledge that they get with a wide theoretical knowledge and thus get as far as their more fortunate brethren.

The Institution of Mechanical Engineers has a compulsory

subject introduced in the Associateship examination in 1933 entitled "Fundamentals of Administration," with the following syllabus:

Part A.—General Considerations.
- Growth of industrialization.
- Main features of early technological development.
- Scope of modern industry.
- Origin and development of the commercial system.
- International trade and exchange.
- Natural resources and commodities of world trade.
- Financial responsibility and control.
- The Limited Company. Partnership.
- Other forms of organization.
- Elements of Commercial Law.
- Outline of Industrial Legislation.
- Industrial relations in practice.

Part B.—Conduct of the Industrial Undertaking.
- Organization of production.
- Organization of distribution.
- Significance of development and research.
- Financial statements: Valuation and Depreciation.
- Principles of Industrial Accounting.
- Principles of Costing and Estimating; Rates, Taxation, Insurance.
- Control of expenditure; Authorization, Budgets, Statistics, and Graphs.
- Office organization.
- General principles of management.
- Division of Functions.
- The Human Factor.

There is also an advanced syllabus on "Workshop organization and Management."

The Institution of Industrial Administration has a library from which books on the subject can be borrowed by those anxious to delve more closely into administrative literature. In U.S.A. the development of this subject is much more marked than here. For example, the Massachusetts Institute of Technology in its engineering course gives time during the third and fourth years to the functions of business and economic organization as they affect the interests of the shareholder, the employee, the market, the community, and the general public. The programme of business and economic subjects aims at encouraging a modern and enlightened attitude towards business problems as they relate to economic, sociological, and political trends, stressing the responsibilities of business to the consumer (in marketing), to the employee (in labour relations), to the investor (in finance), and to other business men (in business law).

Nevertheless, the conclusion of those who believe in fostering administrative ability through study is that the most feasible plan is to develop post-graduate studies, either in evening classes or by organized reading. Engineers and other employees of the Gas Industry may well also be induced to take a leaf out of the book of the medical profession and organize "refresher courses" for practitioners of many years' standing. The Gas Industry needs men fully qualified to undertake the very varied problems of administration. There are hundreds of posts to be filled within the next 20 years or so. Let the Gas Industry organize production of the necessary human raw material. If The Institution of Gas Engineers think that managerial posts should continue to fall to the M.Inst.Gas E., let them organize courses in this important subject and make it compulsory for the Diploma. By so doing they would get a start of the other possible applicants. They will find the lawyers and the accountants tough nuts to crack if the Gas Industry develops by grouping as it appears likely to do.

The Spun-Iron Pipe and Reinforced Spun-Concrete Lamp Column

by
W. M. DICK,
of the Stanton Ironworks Company, Ltd.

From an Address, which was illustrated by films, to the Scottish Junior Gas Association (Western District) at Glasgow on March 25.

The Delavaud-Mairy system of centrifugal casting represents a radical departure from customary foundry practice. With the exception of a short socket core, no sand or loam moulds or cores are used.

Briefly, the system of manufacturing by this spun process is to introduce molten metal into a revolving, water-cooled steel mould, centrifugal force serving to hold the metal against the wall of the mould. The casting shops consist of platforms with batteries of machines so arranged as to permit the systematic delivery of molten metal which is supplied from continuous type cupolas. From the tilting receivers at the cupolas the metal is conveyed in ladles by overhead cranes to the hopper forming part of the actual casting machine.

The machine itself consists of a water box containing a steel mould rotating on friction rollers and driven by an electric motor. This mould is accurately machined, the inside conforming to the outer profile of the pipe. The water box containing the mould is mounted on rollers, and is traversed along twin rails on the machine bed, which is slightly inclined. This movement is actuated by means of a hydraulic cylinder and ram, the latter being attached to the underside of the water box, and the speed is controlled within very narrow limits by means of a fine adustment valve fitted in the hydraulic system. At the upper end of the inclined bed is a frame to which is attached, at the back, a tilting hopper, having a metal-carrying capacity slightly in excess of that required to cast one pipe. In front of the hopper is the fall spout leading to a long cantilever pouring trough. The tilting hopper, which is hydraulically operated, is shaped so that during casting the molten metal is discharged to the mould at a uniform rate. The machine is also fitted with a device to apply a thin coating of ferro-silicon powder to the mould during the casting operation.

The Casting Process.

Describing the procedure of casting, a sand-core, to form the inside of the socket, is inserted in a taper seat at the socket end of the mould, which is at the lower end, and the water box is then moved up to the top of its track. The mould is revolved, and the hopper, which has previously been filled with molten metal, commences to tilt. A uniform stream of iron flows down the fall spout and then along the trough, and is projected at an angle into the mould at the bottom end. When the socket portion is full, the water box travels in a slightly downward direction, and the continuous spiral of molten iron discharging from the end of the trough is deposited on the inside of the mould, and knits together, thus forming the pipe. The pipe is discharged from the mould by inserting internal grip tongues into the socket end of the pipe, and moving the machine once again to the upper part of the track. During this operation, arms automatically function, temporarily supporting the pipe until it is transferred to the adjacent gantry. The pipes are then weighed and rolled along the gantry to a normalizing furnace. After this process, which takes about 30 minutes, the bore of the pipe is scrubbed by means of a high-speed grinder passed up and down the inside of the pipe on a revolving shaft.

Inspection and Testing.

Inspection then takes place, followed by coating and finally the hydraulic test. In the case of gas pipes the general practice is to supply them coated outside only, which coating

is applied by hand to within 6 in. of the spigot end while the pipe is hot. The resultant pipe is of a dense and extremely fine-grained structure, possessing a high degree of toughness and strength, giving a tensile of 16 to 20 tons as compared with 10 tons in the case of sand cast. Under transverse loading a deflection of 4½ in. is normally obtained on a 4 in. diameter 18 ft. long pipe supported at 16 ft. centres. Since incorporating the Mairy patent, resistance to impact has been raised to a distinctive degree. Resistance to impact is measured by a special testing apparatus. The test pipe, containing water at an internal pressure of about 50 lb. per sq.in., is placed on supports 2 ft. apart and subjected to blows delivered by a falling 50 lb. weight. The height through which the weight falls is progressively increased through increments of 2 in. until failure occurs as revealed by leakage of water through the wall of the pipe. The summation of the energies of the blows required to cause fracture is taken as the index of resistance to impact.

Reinforced-Spun Concrete Lamp Columns.

It is interesting to note the demand for these so increased that we found it necessary to set up a self-contained department, separate from our concrete pipe plant.

Manufacture begins with the reinforcement, which is assembled on a frame and spot-welded so that it becomes a single unit incorporating also the spigot. It is then placed in one half of the mould and correctly positioned, concrete bobbins on the longitudinals serving to keep it centralized. The other half of the mould is then laid on and the two bolted together. Placed under the mixing machine in an almost upright position, the mould is then filled with concrete composed of cement, washed and graded sand, and granite, compressed air vibrators attached to the mould serving to ensure a maximum charge. After the base core has been inserted, the mould is placed on the spinning machine, resting on friction rollers which are chain-driven from motors situated below the machine. So tightly does the concrete pack during the spinning that, despite the vibrating during the first fill, a second is necessary, and a further spin completes the process of moulding, the necessary hollow core having been formed by the spinning. The column is then placed in a humid, warm chamber before being stripped of its mould.

Natural stone smooth finish is the most popular, and to obtain it the surface of the column is ground with an abrasive wheel. During this operation it is necessary for the men to wear masks, the majority of the dust, however, being carried off by suction ducts. These columns are available to give lighting point heights up to 25 ft. to meet the Ministry of Transport requirements for both Class "A" and Class "B" lighting, and there is an ample selection of bracket arms to meet all tastes and requirements.

Discussion.

Mr. E. G. Smith (Dumbarton) said that the Paper had been most comprehensive in its survey of the manufacture of spun pipes. He spoke of the internal scrubbing of the pipe, and recalled a Paper given by Mr. S. Lacey on the effect of skin friction on the flow of gas through pipes. Mr. Smith also commented on the rigorous tests that the pipes had to undergo. With regard to the reinforced concrete lamp columns, Mr. Smith asked what were the stresses in these columns in a street as compared with steel columns.

Mr. McGregor (Greenock) asked if there was any special coating for the spun pipe and the effect of electrolytic corrosion on the thinner walls of the spun pipe. He thought that all should be interested in the concrete columns, as this seemed to be a way of retaining the street lighting load.

Mr. Greig (Glasgow) said that they had listened to an entertaining address. He asked if there was any means of varying the thickness of the pipe and what was the specific gravity of the spun pipe as compared with the cast. Mr. Greig thought that Mr. Dick should have shown the advantages of the concrete columns and asked questions regarding length of life, appearance, and fitting of these columns.

Mr. W. Kirk (Motherwell) asked what was the comparative cost of concrete, cast iron, and mild steel, and what was the comparative weights. Mr. Kirk thought the question of weight was most important in considering the erection of such columns in a busy thoroughfare.

Mr. Webster (Port Glasgow) congratulated Mr. Dick on his Paper and his films, and said that he had taken the modern method of showing visitors round the works. The coming of the spun pipe had made possible the more expeditious laying of mains and making of joints. Mr. Webster asked how lamp columns were erected in built up areas and if there was not any difficulty in servicing. He also asked how the connexion to the arm was made.

Mr. Dick, in reply, said that the scrubbing of the pipe smoothed the internal surface. The thickness of the pipe was controlled by the speed at which the mould travelled, a slow travel giving a thick pipe, and *vice-versa*. The question of electrolysis was rather complex, but Mr. Dick thought that there was no difference between spun pipes and cast pipes as regards this form of corrosion. In reply to the question on specific gravity, he said that the sand-cast was slightly heavier than the spun pipe, but the difference was so small as to be negligible. The advantages of concrete columns included no maintenance, longer life, as concrete kept on improving long after it was set. Unlike the cast-iron standard the concrete did not snap if hit by a vehicle. The cost of the 25 ft. standard was similar to that for a steel pillar of the same size, and Mr. Dick thought that the appearance was more pleasing. The weight of such a concrete column was 18 cwt. The only reply Mr. Dick had to make regarding the handling of these columns was that they were being erected without mishap in busy streets and that it was no more difficult a process than the erection of a similar steel column. To make the connexion to the arm a stand pipe was of course necessary.

Mr. N. C. Sturrock thanked Mr. Dick for his Paper and films and concluded the meeting by thanking the members for the support given to him during his year as President of the Association.

North of England Association

The Annual Meeting of the North of England Gas Managers' Association was held at the County Hotel, Newcastle, on Friday, May 5. Owing to the death of Mr. C. Dru Drury, President of the Association, the President-Elect, Mr. T. Law, of Malton, presided.

The election of officers for the ensuing year was as follows:

President.—T. Law (Malton).

Vice-President.—H. P. Allison (Redcar).

Committee.—C. R. Armitage (Hull), W. L. Robertshaw (Sunderland), and W. Tunmore (Bishop Auckland).

Hon. Secretary and Treasurer.—H. D. Lees (Hexham).

Hon. Auditor.—C. C. Walmsley (Sunderland).

The following elections were then made: Mr. J. G. Atkinson (Carlisle), transfer to full membership; Mr. Frank W. Allum (Harrogate), member; Mr. Edward Crowther (Newcastle), member; Mr. James R. Matthew (South Shields), associate member.

It was agreed to make a contribution of £10 10s. to the Benevolent Fund of The Institution of Gas Engineers whose President, Mr. R. Robertson, of Bristol, was present at the meeting and supported the contribution vote.

At a luncheon preceding the meeting, Mr. Robertson said it was a great pleasure to him to attend the meeting of an Association which had provided such distinguished Presidents in the past for The Institution of Gas Engineers. There were four, all of whom had shown by their capacity for the office what good men the Association had in its ranks. The Council of the Institution looked to the districts for co-operation, particularly in the matter of education where local members could assist by stimulating interest of the young man. There was also the question of salaries. Something of an anomaly existed in this direction which was to the disadvantage of the Gas Industry generally. There were other subjects which formed part of the organization's work. Mr. Robertson referred to the death of Mr. C. Dru Drury, who was an old friend of his and for whom he had had the highest regard.

Later, at the meeting, Mr. Law paid tribute to Mr. Dru Drury's work for the Industry and the Association, of which he had been President at the time of his death. Mr. Law also referred to the death of Dr. J. T. Dunn, late Newcastle City Analyst and immediate past-President of the Association, and to the death of Mr. W. Roxby. As a mark of respect the meeting stood in silence.

A Paper was read by Mr. A. G. I. Anderson, of Shotley Bridge, on "Sales in Relation to Local Conditions." This, together with a report of the discussion which followed, will be found elsewhere in this issue.

There was also a discussion on the Joint Conference (B.I.F.) Papers, a report of which appears on a later page.

Sales in Relation to Local Conditions

by

A. G. I. ANDERSON, A.M.I.Chem.E.,

General Manager & Secretary,
Shotley Bridge and Consett District Gas Company.

A Paper to the North of England Gas Managers' Association at their Annual Meeting in Newcastle on May 5.

One of the outstanding features revealed by a study of the records of gas undertakings in this country is the variation in the average consumptions of domestic consumers, both ordinary and prepayment.

Each and every undertaking has its own explanation for its own results which fundamentally resolve into what are in fact local conditions and are governed in the first place by the geographical location of the undertaking.

An area of supply may be entirely residential or almost wholly industrial, it may have a fixed population or a fluctuating population as in the case of holiday resorts, it may be partly industrial and partly residential, its industries may be heavy or light, and its proximity to, or distance from, coal-producing districts will have some influence on the matter.

These conditions are features of locality, but in addition there are others whose influence is entirely or in part irrespective of location such as the capital charges prevailing, and the fact of public or private control of an undertaking may have a considerable effect; not least is the policy of the administration, and there is, of course, the degree of competition from the ever present electrical undertaking.

The following illustration indicates graphically the extent of the variations found in a number of undertakings representing as far as possible the kinds of districts already mentioned and selected as such without regard to any other considerations.

The figures given below for revenue per therm were taken as being reasonably comparable to the price of gas in the undertakings concerned, and while it has unfortunately been impossible to segregate the prices for ordinary and prepayment consumers due to the difficulty of obtaining accurate figures because of operational tariffs, &c., the basis taken and shown is quite comparative in all cases.

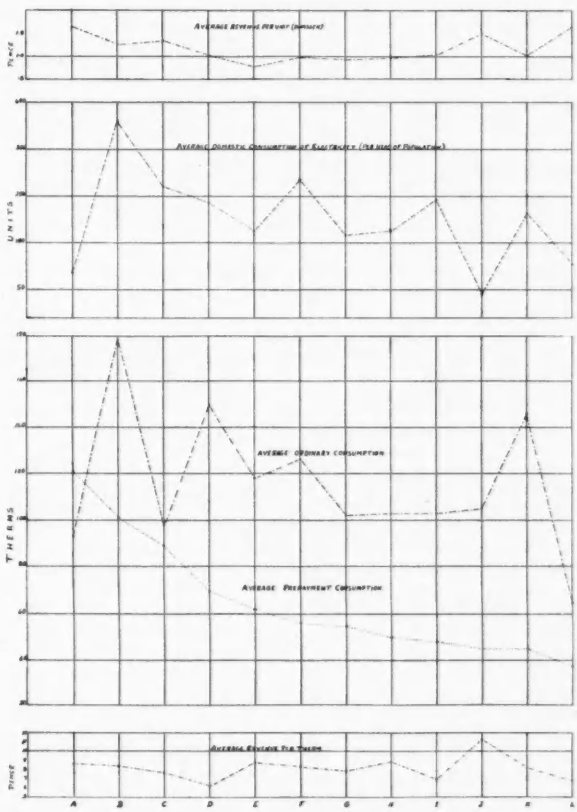
As a matter of interest, the average domestic consumption of electricity per head of population in the areas taken is included along with the average revenue per unit from such consumption.

While this graph illustrates the marked differences prevailing in the examples shown it is inconclusive in other respects except that the factor of price does not appear to operate to the extent that might be expected, but as the methods of charging differ so much in many cases it is unreasonable to draw conclusions from this, although it is obviously not the determining factor. If we consider undertakings in industrial areas where the working-class prepayment consumers are subject to much the same degree of trade conditions and, therefore, presumably much the same kind of average income, the disparity in consumption is quite marked, and we are, therefore, inevitably driven back to a consideration of other local conditions prevailing.

In the first place competition from other fuels must be considered, and so far as electricity is concerned the illustration given is again inconclusive, but it is an acknowledged fact that it continues to find favour, and no gas undertaking is immune from its competition, but while electricity may be termed an incomer to our field the domestic coal fire is an established fact and, as such, has presented a retarding influence on the scope and extension of gas usage.

Competition from Coal.

It is obvious that an undertaking operating in a coal-producing district will experience the fullest effects of competition from cheap domestic coal supplies; at the same time such an undertaking will be expected to offset this disadvantage to a certain extent by reason of being able to obtain a relatively lower priced supply of coal for manufacturing purposes than would a more distant undertaking, but this is only partially true because of other factors which must be taken into account, and, indeed, if the future policy of the coal trade is to increase the price to local undertakings in order to assist the export business, then such local undertakings will have a further problem to deal with.



NOTE.—Consumption of electricity per head of population in the case of Undertaking J is not representative, as it refers only to current supplied by the local electric supply company, and a large portion of this district is supplied from colliery systems.

Accepting then that such an undertaking is to a certain degree restricted in its potential consumption per consumer, it follows that this will be, and often is, reflected in high overhead charges and distribution charges, because it is apparent that the same mains, services, and meters could probably just as easily supply 100 therms per consumer per annum as they could 50 therms, so that these are other factors operating against the price of gas and additionally restricting its scope against competition.

Then again, undertakings in industrial or semi-industrial areas are subject to the effects of fluctuating trade conditions,

with their inevitable reaction on the purchasing power of the working-class consumers.

Residential areas on the other hand are comparatively more stable in this respect, but are probably more subject to the variation in seasonal weather conditions by reason of possessing in many cases a larger domestic heating load. Holiday resorts will be correspondingly affected by seasonal conditions for obvious reasons, and also by the extent of their popularity, and again by the trade conditions prevailing in the districts from which, in the case of the so-called popular resorts, they draw their visitors, all of which conditions are, of course, outside the control of the undertakings concerned.

These, then, are some of the problems confronting gas undertakings throughout the country, and to deal with them they have to adapt their policies to suit the conditions prevailing, in so far as they can be dealt with, because it will, I think, be generally agreed that some of the problems, by reason of their instability, such as weather and trade, are beyond control, so that a policy can only meet what may be termed established problems which in the domestic field are our competitors, coal and electricity.

Of these coal, as previously stated, can be regarded as an established retarding influence, due to the fact that there are few houses in which provision is not already made for coal fires, and in many a coal-fired cooking range is installed, so that we are faced with the necessity for first persuading our prospective consumer to discontinue in whole or in part the use of an existing appliance, and secondly, with proving that gas, or maybe in some cases coke, burning appliances are the best means of substitution, which makes the task doubly difficult. Fortunately the case for replacement of the old-fashioned kitchen range is substantial, and considerable progress has been made in the development of the gas cooking load, but the case for gas fires in place of coal is another matter. Certainly much progress has been made in the installation of gas fires and space heaters in apartments other than what are known as living rooms, but as the living room fire is the one that is in more or less continuous use throughout the day it is clearly the most attractive from the point of view of gas load, and at the same time the most difficult to obtain, although an outlet for coke has been achieved by some undertakings.

The Domestic Lighting Field.

In the domestic lighting field it has to be admitted that electricity continues to make progress, although it is not entirely invulnerable. The introduction of electrically-operated radio sets has greatly assisted the inroads of electric lighting, as have also electric vacuum cleaners, &c., and from the point of view of progress and the lightening of housework by means of such appliances no one would wish to retard their development. But at the same time we must fully realize the assistance of such introductory means in developing the use of electricity for other purposes in the household, and in the cooking field this is becoming increasingly apparent, and, of course, the connexion of electricity with modern developments has in many cases an effect on the attitude of people towards it.

We find, for example, that many people, who represent our consumers either actual or potential, express astonishment when told that there is a flourishing Gas Industry in America; apparently the idea of using gas in that what might be called "Press-the-Button" land seems fantastic, and while this may be amusing to those of us who know otherwise, yet is it not rather a sad reflection on some aspects of our efforts, because it represents so fully the idea created in the minds of too many people that modernity and electricity are inseparably linked, and the natural inference is that gas is, therefore, out-of-date.

How absurd this is can be estimated by a perusal of the results of the manufactured and natural gas undertakings in the United States, and while it is admitted that there many of the gas and electric companies are under joint control and their policy is, therefore, likely to be more realistically economic than is unfortunately the case in this country, yet at the same time they cannot control, although they may influence, the preference of the public for gas and electric appliances. The two fuels are apparently rightly regarded as being complementary to one another in their respective fields of utility, but at the same time no opportunity is lost in furthering their development, and judging by the extent and originality of the propaganda and sales promotional methods used by the gas undertakings, there is nothing half-hearted about them.

In this country, however, we are engaged in the most strenuous competition with electricity in every branch of our activities, and although it is granted that no one can, or should, desire to stop the progress of modern developments, that is no reason for adopting a defeatist attitude about the matter; surely it will be agreed that we have in our modern gas appliances all the qualities of efficiency, convenience, and economy that should satisfy any reasonable person, and such qualities should on merit enable us to hold and extend our business. If this is agreed, what then is retarding us, or, to put it in another way, is it price or prejudice that is assisting our competitors?

Considering coal first, it may be said that in many cases the cost is in its favour, and the prejudice for the retention of the open coal fire is a very powerful factor which can often outweigh its inconvenience and dirt.

Concerning electricity, in most cases gas is competitive in price, and very often is cheaper, and their relative convenience is about the same, but there is a marked prejudice among certain sections of the public in its favour due to a distorted and wholly incorrect idea that because electricity is comparatively modern it must necessarily be better and, of course, one must be fashionably up-to-date.

In an endeavour to observe the influence of these factors, it may be of interest to convert them into terms of values which might be called respectively cost value, convenience value, and prejudice value, and to allot, say, a maximum of five points to each. Considering, then, some hypothetical cases and comparing firstly the three fuels, coal, gas, and electricity, in the case of space heating, it being assumed for our purpose that the price is the same and the cost value, therefore, equal in each case, but a strong bias exists in favour of coal.

—	Cost Value.	Convenience Value.	Prejudice Value.	Total.
Coal	5	0	5	10
Gas	5	5	0	10
Electricity	5	5	0	10

In this illustration all three possess the same ultimate value, but it is clear that if the price of gas and electricity is higher than coal and the cost value therefore decreases the ultimate value of coal will be greater, as the prejudice value outweighs the convenience value of the other two fuels.

On the other hand, if we compare gas and electricity where the price and convenience are the same, but assume a bias in favour of electricity, we are faced with the following:

—	Cost Value.	Convenience Value.	Prejudice Value.	Total.
Gas	5	5	3	13
Electricity	5	5	5	15

This clearly illustrates the effect of prejudice, and, to take an extreme case, where the price of gas is lower but the bias in favour of electricity is greater, we might have the following:

—	Cost Value.	Convenience Value.	Prejudice Value.	Total.
Gas	5	5	0	10
Electricity	4	5	5	14

In this case the total value in favour of electricity is in the ratio of 14—10, and while these examples are admittedly purely hypothetical, there is a certain significance that cannot be disregarded, and that is that except in extreme differences in cost value and assuming the same convenience value, the deciding factor is prejudice, which might be summed up as the degree to which people are coal, gas, or electricity minded.

The factors operating for or against gas sales would, therefore, seem to be price and prejudice, coupled with the progressiveness or otherwise of the undertaking concerned.

These last two are to a certain extent capable of flexibility,

but the matter of price will necessarily be influenced by the operative circumstances of an undertaking.

It is clearly impossible in the scope of this Paper to deal with all the varieties of such local conditions as I have already outlined, and as generalities may be, and often are, misleading, I propose, therefore, to deal briefly with the circumstances affecting my own Company with which I am necessarily most familiar.

We operate in a district where there is only one basic industry, which is iron and steel manufacture, with its allied coal and coke producing plants.

Consumers total 7,936, made up of 1,714 ordinary and 6,222 prepayment, and as the mileage of our mains is 51 and the area of supply is over 20 sq. miles, the scattered nature of the district will be apparent, and the expenditure on distribution is proportionately heavy.

Due to the fact that we are in a solid fuel producing district, the competition from very cheap domestic coal supplies is naturally severe, and since the incursion of patent coke into the domestic field began the effect of this has had a detrimental reaction on our local coke market, so that about 70% of our coke production has to be exported with a consequently diminished revenue, while the fact that the only local industry produces and uses its own gas prevents us obtaining an industrial load for gas.

Increased Coal Costs.

In addition there is active electrical competition both from an electric supply undertaking and from collieries which supply current to workmen's houses and which might be regarded as a vested interest. We are, therefore, not without our own peculiar local conditions which it will be realised are not particularly favourable to the development of gas sales, but as circumstances exist to be overcome they have to be accepted and dealt with accordingly. Unfortunately, we were faced with an increase of 25% on the price of our coal supplies at the beginning of 1936; we are now paying 50% more, and the price of gas had to be increased to meet this, so that the policy of development had to be adjusted to suit.

In the first place, therefore, we decided that before proceeding with other schemes it was necessary to ensure adequate and efficient service in the belief that satisfied consumers are our best advertisements, so steps were taken to remove weak spots from the distribution system and to organize our methods of dealing with complaints, maintenance, and service generally.

This organization has naturally to be suitable for an undertaking of our size, and while it is as comprehensive as possible, it is not unnecessarily cumbersome and has proved very satisfactory. It is said of some people that they are so crazy about organization that they will hardly go through a revolving door without making up a party of four, and, while such an exaggerated conception is obviously ridiculous, yet it cannot be denied that any structure must be based on a predetermined plan; otherwise it will inevitably collapse.

Having, as it were, prepared our foundations, the next step was to push the sales and use of appliances generally, and in this we were handicapped by the fact that our headquarters and showroom were far removed from the shopping and business centre of our district, and in this centre only a small and obscure shop was available, so our methods had to become somewhat unorthodox. We rented temporarily vacant shops in various parts of the district and arranged displays of appliances, the terms for which were fixed on what we considered were reasonably sound lines and likely to prove acceptable. In addition, we advertised extensively, especially by means of posters and handbills, and ran a series of special offer periods during which reduced terms were available, and as further publicity our distribution vehicles were placed on the open Market Place with a selection of appliances and publicity matter displayed, and these vehicles also toured the district on various occasions. Such schemes, along with close collaboration with local organizations, where demonstrations of gas appliances and cooking were arranged, were of great value in popularizing appliances generally, and a further big advance in this direction was made when my Directors decided to build new showrooms and office premises in the business centre, where the headquarters of the Company are now centralized.

These premises, which are planned on very modern lines, with extensive window space, have been of immense value in furthering our efforts, and we endeavour to make our window displays topical and attractive, so that these have now become quite a feature of local interest with the public and local tradespeople, along with whom we occasionally run joint displays, and the goodwill value of these is a considerable advantage.

We believe that a window display without a message is like a motor car without an engine—it won't get you anywhere—and therefore a display should possess sufficient "pep" and not be merely artistic if it is to compel the attention we desire.

These then might be termed propagandist methods, but if one considers propaganda in the widest sense, then it is obvious that they had to be backed up by service and satisfaction among our consumers, and without the whole-hearted co-operation of our staff, who as individuals are the best propagandists we have, no results would have been forthcoming; in this matter we endeavour to consider every man who comes into daily contact with the consuming public as an integral part of the undertaking who can make or mar our schemes, and they are all trained and encouraged as far as possible to be potential salesmen who can, and do, earn commission on appliances sold. But it does not follow because one gasfitter, for example, may be unable to sell as many appliances as another that he is necessarily of less value to us; he may, in fact, be more, because of his ability to give satisfactory service to consumers or in his ability to deal tactfully with a dissatisfied consumer, all of which comprises the subtlest and most effective methods of obtaining among consumers a feeling of goodwill towards gas and the undertaking concerned.

The results over this period, while not spectacular, have, I believe, justified the means employed, unorthodox although some of them may appear, and the following data may be of interest:

The foregoing observations are, of course, applicable to the local conditions prevailing in an undertaking such as described, and while the policy adopted is probably open to criticism on many points, yet I submit that in one respect it might be applicable to any undertaking, and that is in the sphere of propaganda, again using this term in the widest sense of organized and efficient service and the furtherance by every conceivable means of gas-mindedness among the public.

While it is acknowledged that this aspect is dealt with

TABLE 2.

—	Gas Sold, Therms.	Consumers.		Average Domestic Consumption, Therms.		Appliances Sold.							Appliances Hired.	
		Slot.	Ordinary.	Slot.	Ordinary.	Cookers.	Fires.	Boilers.	Washers.	Refrig.	Miscellaneous.	Lighting Burners.	Cookers.	Fires.
1936	451,000	6,039	1,623	43	105	98	152	223	21	4	118	279	271	46
1937	477,000	6,222	1,714	45	113	172	183	153	35	2	135	410	217	26
1938	474,000	6,231	1,759	45	105	126	151	293	62	6	161	541	226	5

Price of gas, 10·2d. a therm ordinary (*less* 0·6d. discount). 7·8d. to 4·8d. central heating and contract rates.
12·5d. ,, slot

Average unemployment in district (percentage of total insurable population)—

1936.	1937.	1938.
7·7 ..	6·9 ..	16·4

In view of the recession in local trade indicated by the unemployment figures during 1938 the maintenance of the average prepayment consumption and sales of appliances was quite a satisfactory feature. Mild weather conditions were mainly responsible for the decrease in average ordinary consumption.

very effectively by many large undertakings, it may be contended that it is beyond the powers of small undertakings to attempt to cope with such matters, but while I was trained in a very large undertaking and am therefore acutely conscious of the limitations necessarily imposed on a small concern, I see no real reason for regarding such a problem as insurmountable solely on that account, because in a lesser business closer personal control can be a very vital asset. It is fashionable nowadays to talk about remote control in all spheres of activity, but the more remote the control the greater is the necessity for ensuring that each part of the mechanism is completely reliable; otherwise the best control may be misdirected, and therefore I submit that, provided the small undertakings realize their limitations and unhesitatingly take counsel in specialist matters from those who are specialists, there is strength in personal control and knowledge of local conditions.

If one compares the average household of 30 years ago with that of to-day, the changed outlook and desire for modern domestic amenities is apparent, and it can be said with truth that the luxuries of to-day are the necessities of to-morrow. It is our task then to convince the present-day public that in gas appliances and the extensive use of gas they have an amenity as modern as the present minute and to provide this service at a reasonable cost.

"Mass-mindedness."

We are faced, of course, with the progress of other means of achieving similar amenities, such as electricity claims to give, and in this respect we are up against another modern characteristic known as "mass-mindedness," which might be described as the lazy and common acceptance of superficial half-truths; conditions in Europe to-day are a striking commentary on this fact, but, whatever may be our opinions regarding the methods adopted to achieve this, few can dispute the effectiveness of the propaganda machinery employed.

The Gas Industry is well aware of the existence in many quarters of the bias favourable to electricity, and, therefore, predisposed against our development, and it would seem good tactics, when confronting an adversary, to endeavour first to remove or overcome any strategic advantages he possesses.

In this respect we have in the B.C.G.A. our organization for such a purpose, and when one considers the variety of conditions prevailing throughout the country it will be realized how difficult its task is and how efficiently, in the face of these conditions, it is being tackled, but at the same time can we claim that we as an Industry are assisting the general propagandist efforts, on which the B.C.G.A. has very wisely embarked, to the fullest possible extent.

Would it not, for example, considerably strengthen the pull of our national advertising if every undertaking sold its appliances at the same prices and on the same terms? Such a move in the right direction has already been made in the regional marketing schemes, and if it can be done regionally surely it is not beyond our powers to overcome the admitted difficulties in the way and extend such a scheme on a national basis.

This, of course, means co-operation and co-ordination among all undertakings, and might be extended with advantage in other spheres of our activities, and the results of such collective efforts might not least be the influence both locally and nationally on the political prejudice which is so often in evidence.

A further advantage would be the appointment of B.C.G.A. Regional Officers who could be primarily responsible for the organization and development of every branch of propaganda in their area, which would, I believe, assist us in dealing more effectively with some of the problems of local conditions and certainly in countering the insidious boosting of electricity which is the result of the activities of such organizations as the Electrical Development Association which, it must be admitted, are very efficiently run.

And it would be unwise to overlook the possibility of further developments in the use of coal in the domestic field, because the household coal trade is not one which the coal industry will willingly relinquish without a struggle, so that continuous research both in our manufacturing and distribution methods is a very essential part of planned endeavour if gas is to hold its own against competition of all kinds.

Also in our efforts to sell and promote the use of gas let it not be forgotten that we are estimated to have almost seven million prepayment consumers out of a total of eleven million, because if we attempt to indulge in selling methods which, for want of a better term, might be called too "B.B.C.-ish," we shall not strike that note of popular appeal to all classes which should, in the words of a well-known advertisement, make gas "the talk of the town."

It might be said then that, whatever the local conditions may be, the degree of efficiency of the undertaking concerned will have an effect on the public mind which will either be favourable or otherwise to gas as a fuel and to the Gas Industry as a whole, and as the strength of a chain is the strength of the weakest link, it follows that on the efficiency and soundness of even the smallest links the progress of our Industry depends.

Discussion.

Mr. T. Law (Malton) said a gas undertaking could be a success whether under private or public control if conducted properly; maybe service was the decisive factor. He agreed that it would be a great thing if they could persuade consumers to install gas fires in their living rooms, but they were up against the Englishman's inherent love of a coal fire in which he could use a poker. They must strive for a special price which would be no higher than coal as a first step. He was rather surprised to hear of the price of Mr. Anderson's coal being increased 50%. His was increased 25%—and they thought that a lot. He would be interested to know how they increased the price of gas with such a coal price increase.

Mr. R. H. Duxbury (Southbank) said he had been much interested in the Paper because the only big difference between the undertaking and his own was the public lighting, which Southbank had practically lost. There was no doubt that the introduction of all-main radio sets had had an influence on the installation of electricity in homes. It was a pity research work into gas-operated radio sets had not been undertaken sooner. He was glad Mr. Anderson had pointed out that gas was so greatly used in America; that was the sort of thing to tell the public. It was the kind of publicity needed to show that gas was by no means out of date. He recalled taking a Medical Officer to see the Gas Industry films in Newcastle and he was astonished at what he saw. "Why don't you tell the people more of this?" he asked. He would be interested to know exactly what the Author meant by "preparing the foundations of a campaign." He added that at Southbank they had distributed complaint cards, and he was quite satisfied they were getting information which they would not otherwise have obtained from customers. He noted with interest that all employees were trained to be potential salesmen, but did all employee stokers and labourers share in the commissions? It was possible to have men doing great service indirectly in promoting the greater use of gas without coming into the commission scheme. In his view everyone had a right to commission if it was decided to pay commission. He agreed that the B.C.G.A. had done a lot of good work, but personally he did not see eye to eye with it regarding advertisements. He thought the idea of regional offices was a good one, because the type of publicity in the South was not suitable for their area. He also agreed with the suggestion of appliances being a uniform price, but knew there were many difficulties in the way. Mr. Duxbury mentioned the problem raised by the big building schemes going on. In the old days £1,000 per million was considered the maximum—but what of the future?

Mr. E. Crowther (Newcastle) said he agreed with keeping up the sale of gas and extending it, and if it kept pace with the capital then Mr. Duxbury had answered his own question. There was no doubt that the most important thing in any selling campaign was the preliminary work. Many selling schemes had come completely unstuck through lack of carefully planning the ground in advance. He had seen undertakings of different sizes handling what seemed to be co-ordinated selling schemes with admittedly different district conditions—but the difference in results was astonishing, largely due to lack of foresight of the man on the spot before launching on the scheme. It was foolish to set to work selling apparatus unless satisfied before putting it into a house that gas, meter, and everything else would be ready. He had known water heaters which had not had the chance of functioning successfully because the supply of gas was inadequate. There was nothing more exasperating to a consumer than to be made interested in something to the extent of placing an order and then having to wait: it unsettled him, and the Industry started off on the wrong foot. He admitted those were exceptional cases, as the average undertaking was in a position to meet customers' requirements and did do, day by day and year by year, with complete satisfaction. He felt they too often assumed that they should sell apparatus cheaper than they need. He had no desire that extravagant profits should be made out of apparatus;

but they must look ahead, especially when dealing with hire-purchase business. There was a certain amount of maintenance and individual attention, the payment of interest, cost of collection, and other expenses. There was no reason why they should not be recovered in the payment for the apparatus. If not recovered in that way there was only one other way and that was through the price of gas. Apparatus should bear all the costs associated with it, and then gas could be sold more cheaply.

The Author's Reply.

Mr. Anderson, replying to the discussion, said that the price of gas was increased 0·6d. per therm and 0·76d. to slot consumers. Probably Mr. Law was right in saying that private and public control could both be successful. He might have been unfortunate in his experience of some public undertakings, but there was no real reason why it should not be efficient. He thought Mr. Crowther had adequately covered the points about preparing the foundations. He mentioned one of his local difficulties; that was, some of his consumers lived at an altitude of 600 ft. above the works, and in some points the pressure had been doubled. He always believed in paying a lot of attention to the persistent complainant because one person always talking against gas could do a great deal of harm even though the complaint might be unfounded. He agreed the commission system was not quite fair to some men, but it was the best system they could devise.

He agreed with Mr. Duxbury's criticism of the B.C.G.A. advertising. What went down in the South would not necessarily go down in the North. Canvassers had found the Northern districts their graveyard though the local people sold things. He concurred with Mr. Crowther on the capital per million though he would like to keep the capital as it was and increase the output. He also agreed with his point on the cost of appliances. A good quality article was worth its price. Unfortunately much of the apparatus now in possession of consumers was not being used. If everyone with a gas cooker used it exclusively for their cooking they would have to extend their works.

Vote of Thanks.

Mr. F. L. Scaife (Stockton), moving a vote of thanks to Mr. Anderson, mentioned that they found the taking of temporary premises had been a successful way of selling apparatus.

Mr. A. S. Middleton (Durham), seconding, said it would be a big mistake always to regard gas and electricity as alternative. Electricity had come to stay and their main job was to insist that gas got a fair deal for those things for which it was eminently suitable; but to regard it as out-of-date because they could not work wireless by gas was to take a wrong view of the matter. There was something to be said about national trends but at the same time their local problems and conditions were equally important factors.

Retention and Development of the Domestic Gas Load

North of England Association Discuss the Joint Gas Conference (B.I.F.) Papers.

Mr. T. P. Ridley (Secretary and General Manager of the Newcastle and Gateshead Gas Company) opened a discussion on the Retention and Development of the Domestic Gas Load, based on the Papers given at the British Gas Federation Conference at the British Industries Fair, and said that Mr. Currier had asked whether the Gas Industry really wanted the space heating load. He thought they would all reply that they certainly did, and every other load they could get. The gas fire had established itself for intermittent use, and the Industry in the past had contented itself with intermittent heating and with the greater proportion of the gas fires standing in front of the coal fireplace. But if gas could be supplied at suitable prices, they should all go out for continuous heating.

To educate the public up to the total elimination of solid fuel was slow work and particularly in an area where coal was cheap, but in Newcastle they had been pressing such a scheme and now had 300 consumers who had replaced all their solid fuel by gaseous fuel, and while the average consumption per ordinary domestic consumer was 130 therms, the average of those houses with all-gas heating was 650 therms a year. That showed the high potentialities of the domestic consumer and made it worth while to do everything to obtain the business.

In the North of England, where many of them could obtain supplies of coke oven gas and where they were well placed for the export of coke, they need not go out for both gas and coke heating. They could afford to go out for all gas heating. The first obstacle to this was that gas must be offered at prices which were near the competitive price of household coal, which was obtainable in this district at about 34s. per ton delivered. Where coal was higher in price, so the price of gas could be higher. For instance, in London and the South Coast, there could be a substantially higher price for gas than in Newcastle and still be competitive with household coal.

Tariffs Essential.

Generally speaking, where the flat rate price of gas was in vogue it was useless to try to get continuous heating by gas. Tariffs must be introduced. They had a domestic block tariff and the blocks were graduated with the size of the house. Again, the larger the house the larger, generally speaking, the consumption of gas, and therefore the consumer living in a small house had approximately the same chance as the consumer living in the larger house of getting to the lowest priced block, which was the price which competed with coal. Since the introduction of the domestic block tariff there had been an increase in the consumption by the domestic consumer. He knew that to introduce a general block tariff meant an initial loss of revenue and at the present time gas undertakings could not afford to lose revenue. In many cases there had been increases in price and there would be still more increases. In cases where a general block tariff could not be introduced owing to loss of revenue, he did not see why a special tariff should not be introduced applied only to consumers who went over to all gas heating. All that was required was to set out clearly the conditions, and everyone complying with those conditions should be eligible for such tariff and with suitable conditions there could be a competitive price of gas without loss of revenue.

The second obstacle was the cost of conversion of appliances from solid fuel to gaseous fuel. To assist in overcoming that difficulty, his Directors had agreed that until 500 houses had become all gas-heated, they would supply to the consumers who undertook the all-gas heated scheme the necessary gas appliances at specially low prices. When the 500 houses had been converted, they would review the situation as to whether it was necessary or desirable to continue the present terms or to modify them. Consumers who were so assisted had to undertake to continue the use of gas only for all heating purposes for three years.

The third obstacle was lack of facility to burn rubbish. The question arose, after conversion to gaseous fuel, as to whether the consumer was satisfied with the results.

They asked Haroid Whitehead and staff, as independent people, to make a survey and report to them on the development of the all-gas heating scheme. They interviewed 72 such consumers and reported that the results showed very nearly complete unanimity in satisfaction with the results of all-gas heating. With regard to costs, they reported that the answers were again indicative of general satisfaction.

Mr. Ridley recalled a case which occurred in their head office showroom when a lady was inquiring about all-gas heating, and when the clerk began to enumerate the advantages another lady standing near interrupted them and explained to the first lady that she had an all-gas house which was "simply wonderful" and she would not go back to coal "for anything." He could speak from personal experience that the all-gas heated house, while helping smoke abatement, was greatly appreciated by those who once experienced its comforts and convenience.

In his opinion, the Industry was not convinced on the subject beyond a pious hope and was not making sufficient effort to obtain the greatly increased consumption which all-gas heating of houses brought. The earlier that live and decisive action was taken the better, because it must of necessity be a slow process.

A final word, added Mr. Ridley, regarding gas lighting. They were all doing what they could to retain this. Where gas lighting had been accepted they supplied new installations complete with burners, globes, and mantles, and in all other cases they replaced

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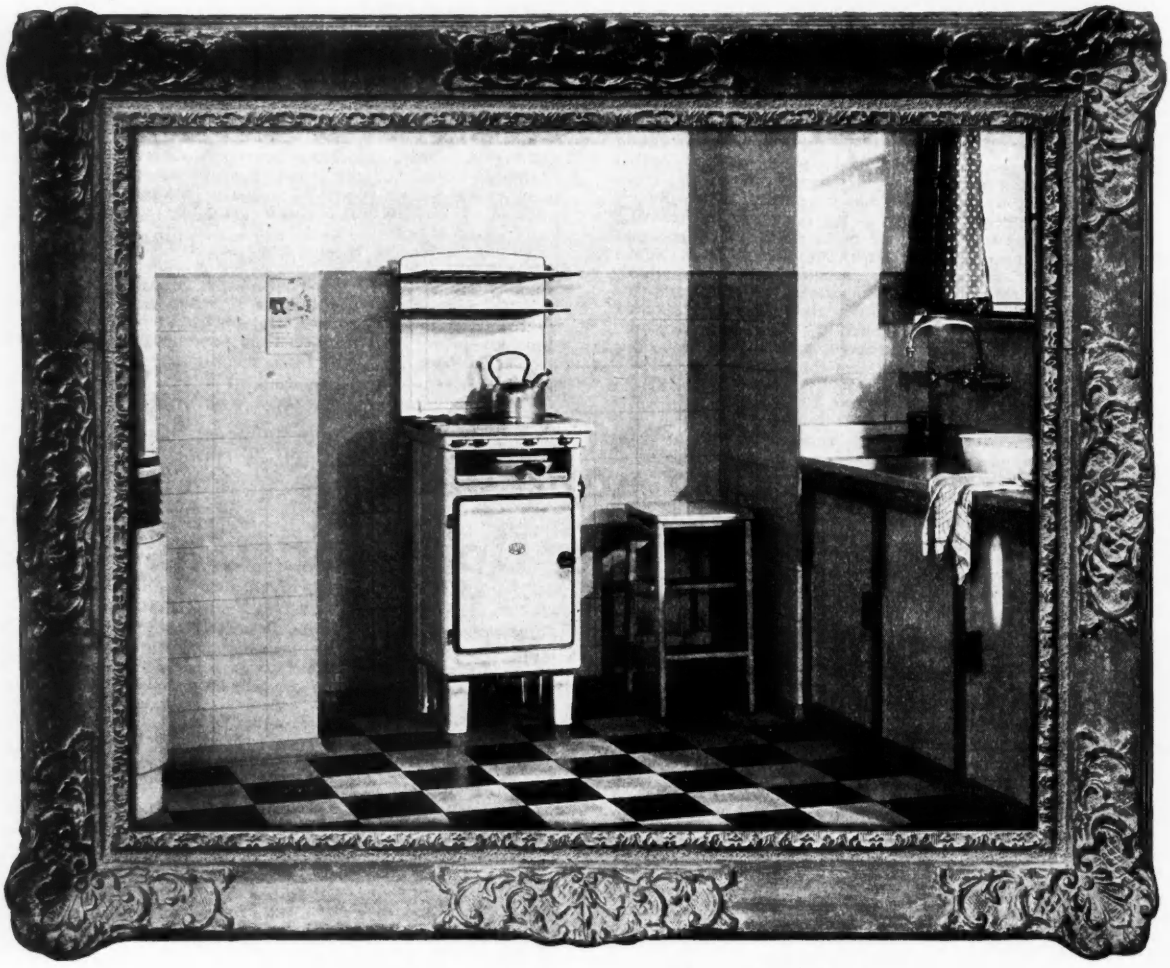

A modern kitchen interior illustrating one of the foremost cookers of the day.

No. MAIN 527

STREAMLINED GAS COOKER

R. & A. MAIN LIMITED, LONDON & FALKIRK

burners and fittings at considerably below cost. In 1938 they regained from electricity more cases for gas than in any previous year.

Need for Regular Maintenance.

Mr. A. E. Ruffhead (of Darlington) said that Mr. Dixon's Paper on gas cookers had aroused considerable interest. One of the secrets of maintaining and developing the domestic load was the periodical maintenance of appliances alike to both ordinary and slot consumers. They endeavoured to send maintenance men round the whole of their area. Such visits were helpful in more ways than one, because they found in Darlington that canvassers for wireless sets and vacuum cleaners made unscrupulous statements about cheap electricity as an encouragement for the installation of electricity for wireless sets and vacuum cleaners. Mr. Dixon suggested that it was not always a good policy to use enamel, and there was a place for the black cooker of modern design and reasonable efficiency. They had gone in for re-enamelling and they found consumers ready to pay extra for it. Their year ended on March 31 and they were able to report an increase in sales of gas by 4¾%, whereas for the first time sales of electricity were below them with only 4% increase. In other years, electricity had had increases up to 20% and theirs had been only 2½%.

He thought a simple set of block rates would help to keep the domestic trade. He had been unable to find reasons for special charges for special purposes.

They went out to supply cheap gas fires on hire, and they saw people got any colour they required. Certainly, some people had peculiar ideas about colour, but they got what they wanted. They also supplied sink water heaters on hire. Refrigerators were good if they could sell them; and if they lost the lighting load the refrigerators made up for it again.

There was a point on which he thought they ought to take action nationally and approach the Ministry of Health, urging them that some reasonable sort of flue in a room be compulsory. The small openings of about 100 sq.in. which were put into modern house rooms for ventilation were, he thought, quite inadequate.

He thought it a good thing where possible to extend the period of hire purchase, and they had one period of seven years where the value of the appliances was high. It was also a good thing if the number of appliances bought on the hire purchase could be all put together and a hire purchase rate fixed for the lot. The consumer knew what he had to pay over a period, and it enabled them to get the benefit from the use of the appliances sooner than if a consumer bought one first and then another.

They believed in training their men and had special classes for them in the fixing and working of appliances. They had had good results from this.

Mr. C. F. Barrow (Sunderland) said that with goodwill, enthusiasm, courage, and initiative among the staff, a good deal could be done to increase gas sales. He instanced a campaign which they had made at Sunderland with very successful results. They were concerned at the fact that their consumers were using the hotplates of their cookers much more than the oven, and so they launched a campaign to increase the use of the oven by introducing a special roasting tin. It was quickly appreciated by consumers, and they eventually sold 36,000 of them. They believed in enamelled cookers, and he thought they were among the pioneers in this; over a period they had sold 8,000. Some of the consumers who had bought these were now coming in for more modern cookers, and the enamelled cookers were being transferred to slot consumers.

Alleged Maladministration at Southport

The hearing was resumed on May 5 at the Southport Police Court, of summonses against Mr. J. H. Clegg, the Southport Corporation Gas Engineer, and Mr. W. E. Plevin, the Deputy Engineer, alleging conspiracy at the gas-works in illegal practices in the administration of the Gas Undertaking. Reports of previous hearings were published in the "JOURNAL" for March 1, 15, 22, and 29, and April 5, 19, and 26.

Howard, who had been in the witness-box at a previous hearing, was recalled and cross-examined by Mr. Blackledge (for Clegg).

He agreed that failure to make an analysis on the arrival of a train load of coal might lead to the loss of an opportunity to reject inferior coal.

"If tests were not being made and a bad quality of coal was being supplied, unknown to Mr. Clegg, certain factors were coming in to reduce the calorific value. Mr. Clegg rightly attaches considerable importance to the question, as to his repeated complaints as to regular analyses being kept, so that he would be able to do something about rejecting consignments," Mr. Blackledge added.

Mr. Blackledge: The make per ton and calorific value can be affected by a bad consignment of coal?

Witness: Yes.

"Mr. Clegg's instructions to carry out the tests were completely disregarded," continued Mr. Blackledge, to which witness replied, "Not persistently," adding that they tried to carry them out whenever their other duties allowed.

Did you ever complain that there was never any time to make these tests?—Complaints were made, but I never complained.

Witness agreed that considerable constructional and repair work had been carried out at Crowlands after Clegg came and before Plevin arrived, including alteration to the purification plant.

Would I be right in saying Mr. Clegg never told you to do anything that was dishonourable?—Yes.

On Jan. 6, 1938, you were one of the people who went to see Mr. Clegg?—Yes.

At that meeting calorific gas was not mentioned?—Yes, it was mentioned. I asked Mr. Clegg if he was prepared to accept a low calorific value temporarily in order to resist the purification trouble.

Grainger said something at the interview that they were concerned at the fact that sulphuretted hydrogen was going on the town, but witness did not remember Grainger using the words: "and we hope we will not be blamed for it."

He did not agree it would have been possible for Clegg to have gained the impression that the visit was by two disgruntled chemists who had come to complain of an increase in salary to others.

Howard, replying to Counsel, said he was not aware that the night shift chemists were slack, sometimes slept during their duties, and left the day chemists to do the work.

Mr. Blackledge said he would submit at the close of the case for the prosecution that there was not a vestige of evidence on which a person ought to be put on a criminal trial, in regard to matters in the case, as far as his client was concerned. If the Bench decided there was a case for trial, then his client welcomed the opportunity of trial by jury, although he did not welcome the expense of going to the jury. But if the Bench thought that among "all this extraordinary evidence," there was a case for trial, then his client would welcome the opportunity of going to trial by jury, and would minimize the time occupied by calling the evidence of the defence twice.

Howard was then questioned by Mr. Robertson Crichton (for Plevin), who received the permission of the Bench to put a number of questions about purification. Howard said he had had an opportunity of going through the purification record book. Throughout 1938 the air supply to the purifiers was less varied, he said, than in 1937. To a minor extent, this would be responsible for the better behaviour of the purification boxes. There were more clean boxes in August to October, 1938, than in 1937, because of the changing of the purification boxes.

Howard, replying to Mr. Shawcross in re-examination, said that the various factors other than throughput of coal which might affect the make per ton were correctly attended to by him during 1937. During the year ended March, 1939, the gas being produced at Crowlands had been of proper quality.

As far as he knew all the factors affecting the proper production of gas were now correct, including the amount of coal used. This was one of the factors, and another was the capacity of the purifiers. He did not know whether there had been any drop in the make per ton during the year ended March 31, 1939, as compared with the previous year.

S.B.G.I. PRESIDENTIAL ADDRESS

(*Concluded from p. 396.*)

In 1937 the Joint Committee of Lords and Commons, of which I was a member—naturally before I had any connexion with the Gas Industry—recognized this fact, but nevertheless recommended that undertakings should have the right to impose a minimum quarterly charge, bearing in mind that if that were done in the right way by the encouragement of the greater use of gas in small households, the result should not be a hardship but in the aggregate a greater consumption of cheaper gas.

Contrary to the views expressed by some, the Gas Industry cannot therefore be said to be obsolescent or old-fashioned, but will continue to occupy an important place among public utility undertakings.

COMPANY MEETINGS

South-Eastern Gas Corporation, Ltd.

The Seventh Ordinary General Meeting of the South-Eastern Gas Corporation, Ltd., was held on May 3 at the Offices of the Company, 84, Horseferry Road, London, S.W. Sir DAVID MILNE-WATSON, Bt., LL.D., D.L. (Chairman of the Company), presided.

The GENERAL MANAGER and SECRETARY (Mr. H. A. Probin. A.C.A.) having read the notice convening the meeting and the report of the auditors,

The CHAIRMAN said:—Shareholders have received copies of the report and accounts for the past year, and I take it that you do not wish to have them read.

Weather and Sales.

Before dealing with the results of the Corporation I would like to give you a brief account of the working of our associated companies for the year 1938. Sales of gas were adversely affected by the mild weather, particularly during the first quarter of the year, when the average temperature was the highest known for 150 years. There was another exceptionally warm spell during November and the early part of December, and, although a few days of extremely cold weather followed, this came too late and lasted too short a time to compensate for the lack of cold weather during the rest of the year.

Companies supplying the residential areas where nearly all the gas is used for domestic purposes, such as Tunbridge Wells and Broadstairs, naturally suffered the most, and several companies sold slightly less gas than in 1937. It is most satisfactory, therefore, to record that, taking all the companies associated with the Corporation as a whole there was a small increase in the sale of gas.

During the week of cold weather in December all our companies broke their previous records for maximum output. In most cases the increase was very considerable, and as an instance I might give the North Middlesex Company, where the output for December 21, 1938, was over 6,000,000 cubic feet, an increase of no less than 32 per cent. on the previous record day in December, 1937.

The change to cold weather came very suddenly and the exceptional demand for gas made a heavy call on our plant. The associated companies supply gas to over 300,000 consumers, and I am very pleased to say that full supplies were maintained to all of them. This necessitated an exceptional amount of hard work on the part of the staff and workmen, and I should like to express our appreciation of their willing service.

Price of Coal.

I now come to a subject with which I dealt in considerable detail in my speech last year, and that is the price of coal. Contracts made since the coal selling schemes came into operation have been at very much higher prices than before, and this involved a serious increase in cost to our companies during 1938, even though some coal was still being received under old contracts at less than the present price. In 1939 the increase in cost will be still more serious, as all coal will be purchased at the higher prices now ruling. As a result ten of our companies have been forced to increase the price of gas from the beginning of this year.

I will now ask you to turn to the revenue account of the Corporation for the year, which you will find on page 6 of the accounts. I can say generally that there is little change from last year. Only one small company, the Cranbrook Gas Company, Ltd., was acquired and any changes are mainly due to the inclusion of a full year's income and expenditure for the North Middlesex and Windsor Gas Companies, which were acquired during 1937.

Income from Investments.

Taking the credit side first, the net income from investments is up by £1,720. The increase in gross income was larger, but income-tax has been deducted at 5s. 6d. instead of 5s. Other income shows an increase of £12,532, partly because additional income from North Middlesex and Windsor is included, and partly because more was received in loan interest on account of the increase in the amount of loans to the subsidiary companies.

On the debit side of the account general expenses were up by £2,108 on account of the increased work now done at the head office. The charge for Debenture interest is over £8,000 more, by reason of the issue of £350,000 3½% Debenture stock made in April, 1938, which I mentioned last year. As the proceeds of the issue were used to repay loans there is a net saving of £5,500 on bank and loan interest; £3,141 more is provided for income-tax and the net result is that £162,399 remains to be carried to the net revenue account, compared with £156,607 in the previous year.

Taking into account the balance brought forward from last year and after deducting the Preference dividends and the interim dividend of 3%, less tax, paid in September, there remains a balance of £112,740 available for distribution. Out of this the Directors recommend the payment of a final dividend of 3%, less tax, which will absorb £43,419 and leave £69,321 to be carried forward to the credit of the current year, compared with £48,692 brought in. The balance carried forward has thus been increased by £20,629, and I am pleased to say that the net revenue for the year would again have been sufficient to pay a dividend of more than 7% on the Ordinary shares.

I should be glad if you would now turn to the balance-sheet, which you will find on the preceding page. Taking the right-hand side first you will see that additional investments during the year cost less than £11,000. This represents the cost of acquiring a controlling interest in the Cranbrook Gas Company, Ltd., and of small additions to our holdings in other subsidiary companies.

Loans to Subsidiary Companies.

The only other item on this side to which I should like to call your attention is the figure of £481,500 for loans to subsidiary and other companies. The rapid expansion of hire-purchase sales was one reason for a number of companies increasing their loans from the Corporation. Money used to finance hire-purchase in this way will, of course, be recovered over a comparatively short period. Arrangements are being made for certain of our companies to issue further capital to repay these loans, and one of them has already placed £25,000 of 4% Debenture stock.

On the other side of the balance-sheet the issue share capital remains the same as before, but the loan capital is increased by the addition of £350,000 ¼% Debenture stock already referred to. The expenses of this issue and the costs of acquisition in connexion with Cranbrook, amounting in all to £4,776, have been written off to the capital reserve account.

Other deposits and temporary loans amount to £519,553. These were reduced at the beginning of the year as a result of the issue of Debenture stock, but have since been increased on account of the additional loans made to subsidiary companies.

Increase of Capital.

You will have seen from the note in the Directors' report that there are now only 3,703 Ordinary shares of £1 each available for issue. In order to meet possible requirements in the future a resolution will be proposed at this meeting to increase the authorized share capital of the Corporation to £5,000,000 by the creation of 1,000,000 additional Ordinary shares of £1 each, ranking *pari passu* with the existing Ordinary shares.

You will very possibly have seen from newspaper reports that the House of Lords have appointed a Select Committee to consider whether the control of statutory undertakings by holding companies warrants any change being made in the provisions usually inserted in the Acts and Orders governing such undertakings. The enquiry, which covers gas, water, and electricity companies, is to begin shortly and it would not be proper for me to deal with this subject now.

Report on Gas Industry.

A report on the Gas Industry has just been issued by the Political and Economic Planning Group. This independent report stresses the great importance of the Gas Industry in the national economy both in peace and war. The Gas Industry, with its recovery of by-products, provides the most efficient way of turning our national resources of coal into smokeless and convenient fuels.

Figures are given to show the enormous scope that still remains for gas in meeting domestic demands for hot water and space heating which are at present met by the burning of raw coal with the consequent production of smoke.

Some of the proposals for re-organization made in this report will not be acceptable to the Gas Industry as a whole, and I am only proposing to deal now with certain questions which more particularly affect holding companies.

The report draws special attention to the large number of small units which still exist in the Industry. It shows that 180 gas undertakings supply 86% of the gas sold in Great Britain, while the remaining 14% of the sales are distributed over more than 1,000 undertakings, and submits that the existence of a large number of

small independent undertakings is a source of weakness to the industry.

I might say here that, although there are over 1,200 separate undertakings in existence, a substantial reduction in the number of administrative units has already been achieved by the progress of the holding company movement. Holding companies already control 242 undertakings, and, in many cases, economies and advantages have been obtained which would not have been possible if the undertakings had continued under independent management.

Small Units and Regional Control.

The suggested scheme of re-organization contemplates the formation of local gas undertakings into regional groups, and emphasizes the fact that although regional control of policy on broad lines is essential towards progress, it is no less essential that local undertakings should have some freedom to adapt their methods to local needs, which vary widely from one district to another.

It will also be remembered that the McGowan Committee, which was set up to consider the distribution side of the electricity supply industry, recommended that the number of separate undertakings should be substantially reduced by the formation of larger units, in order to obtain the most efficient and economical distribution of current.

It has always been the policy of this Corporation to plan its operations on a regional basis, so as to obtain the greatest possible degree of co-ordination between undertakings, and I should like to tell you something of the progress made by us in this direction last year.

Co-ordination in Production.

Taking the production side first, the works of the Sittingbourne Company at Murston has been closed down and a bulk supply given from the Gillingham Works of the Rochester, Chatham and Gillingham Gas Company. A main is now being laid from Sittingbourne to Sheerness, and in the course of this year the bulk supply from the Gillingham Works will be extended to the Sheppy Company. A small works at Wateringbury has also been closed down, and a supply of gas given from the Mid-Kent Gas Company.

Other schemes for bulk supplies are under consideration, but it must be remembered that the economies to be achieved, although often substantial, do not always justify the closing down of an existing works where this is of sufficient capacity. The greatest economies can be achieved when a bulk supply can be given as an alternative to a costly reconstruction of an existing works.

On the sales side, considerable progress has been made towards standardization of appliance prices—another desirable end. All companies in the western group adjoining the Gas Light and Coke Company are now selling appliances at the same prices as that Company, while a greater degree of uniformity in the pricing of appliances has been achieved for the Companies in Kent and East Sussex.

The Hire Purchase Act, 1938, came into force at the beginning of this year, and this necessitated the introduction of new agreements for hire-purchase and credit sales. Standard forms were drawn up for use by all the Companies associated with the Corporation, and this is a further example of the way in which unnecessary differences in practice can be eliminated over a wide area.

Standard Types of Two-part Tariff.

The introduction of tariffs, which are so important as a means of securing additional business for gas, is, in some ways, a matter that must be dealt with individually by each Company, but the Corporation has been able to lay down certain general lines. For instance, although the price at which gas is supplied naturally varies according to the cost of production and distribution, standard types of two-part tariff have been adopted in most of our associated Companies for such purposes as central heating, bread baking, and fish frying. Domestic two-part tariffs are being introduced into the Companies as rapidly as possible, but a great deal of work is involved in their preparation, as each one must be designed to meet the local circumstances.

I should now like to tell you something of the work which is going on at individual Companies. The cold weather in December showed us where additional plant would be required in the future, and orders have been placed for two large extensions of carbonizing plant and for various ancillary plant.

Four new benzole plants were put to work in the course of last year and orders have been placed for three more plants and for the extension of one existing plant. The production of benzole is a valuable source of extra revenue, and is of national importance at the present time, since it increases the supply of home-produced motor spirit.

In the course of the past year the Folkestone Company opened a new showroom in Sandgate Road. The purchase of the site and the construction of the showroom were financed by the Corporation, and the new showroom should prove a valuable asset to the Company. Several other showrooms were reconstructed and improved.

Sales of Appliances Maintained.

In spite of the uncertainties of the international situation, the sales of appliances last year were maintained at a very satisfactory level, and no fewer than six Companies had record sales. Apart from this success in the domestic field, various special contracts were obtained. Gas is to be used for all central services in the new Kitchener Barracks to be erected at Chatham, and in new barracks at Mill Hill. A number of valuable central heating orders have been obtained, one being the provision of central heating and domestic hot water for a new police station at Slough. Other important contracts include installations of radiant panel heating for factories and gas-ovens for a large new bakery in the Uxbridge area.

The Corporation's industrial representative has again been of great service to the Companies in securing business of this type.

Several public lighting contracts were obtained, among which I might mention a seven-year contract with the Chatham Corporation and five-year contracts with the boroughs of Slough and Windsor and the Urban District of Uxbridge.

Since the general meeting last year the secretarial and accountancy work of a further five important Companies has been transferred to the head office of the Corporation in London. I told you last year that we were proceeding gradually with the transfer of this work, as we find that it can be carried out efficiently and economically in this way.

Air Raid Precautions.

A great deal of attention was given last year to air raid precautions. As you know, the Government has recently introduced a Bill requiring protection to be provided for all employees. Schemes for protecting plant and personnel under what is known as the "Good Employers' Code" were prepared and approved for all our Companies last year, and are now in most cases completed. It may interest you to know that the total cost of these schemes will be more than £20,000.

In the case of three Companies which are regarded as forming part of the London area, that is to say, Rochester, North Middlesex, and Gravesend, further measures are being taken to ensure that supplies of gas will be maintained in the event of an emergency. Schemes have been approved by the Home Office, under which these Companies will receive grants of 50% of their expenditure on standby plant and mains for linking up with other gas undertakings.

The holiday arrangements of all the associated Companies were reviewed last year. Certain differences were found to exist, and it was decided to give extra holidays so as to bring all the Companies up to the same standard. Increased holidays were given in 11 Companies, and all our men now receive one week's holiday and six public holidays with pay each year.

National Defence.

In connexion with National Defence, I might say that the policy of the Directors has always been to encourage employees to join the Territorial Army by granting them additional holidays in proportion to the time which is spent at camp each year.

The very satisfactory results achieved last year are evidence of the good work which has again been carried out by the staff and employees of the associated Companies and of the Corporation, to whom I should like to express the thanks of the Directors.

The CHAIRMAN concluded by moving the adoption of the report and accounts.

Mr. HERNY WOODALL, M.Inst.C.E., seconded the resolution, which was carried unanimously.

The dividend was approved; the retiring Directors, Sir David Milne-Watson and Mr. K. W. Hickman, were re-elected; the Auditors, Messrs. Cash, Stone, & Co., were reappointed, and the increase of capital having been approved, the meeting terminated with a cordial vote of thanks to the Chairman, Directors, and Staff.

Australian Gas Light Company

In accordance with Section 13 of the Gas and Electricity Act, 1935, the Directors will offer for sale by public auction on Monday, May 22, at 10 a.m., through their auctioneers, Richardson & Wrench, Ltd., 92, Pitt Street, Sydney, "A" shares of £6 each to a number not exceeding 15,000.

The shares will be offered in lots of not more than 16 shares.

The shares will rank for dividend on the amount paid therefor exclusive of the amount of premium, if any, as from the date upon which such moneys are paid and notwithstanding the provisions of the Company's own Act of Parliament. A reserve price will be fixed in accordance with the Gas and Electricity Act, 1935, below which the shares will not be sold. The purchaser shall pay to the auctioneers as agent for the Company the full purchase price in cash of all shares purchased or a deposit in cash of £3 per share together with the amount of the premium if any and the balance shall be paid to the auctioneers on or before June 30, 1939.

Severn Valley Gas Corporation

The Annual General Meeting of the Severn Valley Gas Corporation was held on Friday last at Winchester House, London, E.C. 2—Major JULIAN DAY (the Chairman) presiding.

THE CHAIRMAN'S ADDRESS.

The CHAIRMAN, moving the adoption of the report and accounts, said:

In the balance sheet on the assets side, the principal changes arise from new investments. Investments in subsidiary companies acquired during the year amounted to £208,007. Other investments have been increased by approximately £22,000.

On the liabilities side, increases in the issued capital are shown. Approximately £34,000 of the Four-and-a-half per Cent. Cumulative Preference share issue, in spite of the very unfavourable investment conditions prevailing, were sold for cash at 20s. 6d. per share less expenses. The number of issued Ordinary shares has increased by 107,692 shares, which were issued at a valuation of 22s. 3d. per share to shareholders of the Shrewsbury Gas Light Company (one of the two subsidiaries acquired during the year).

Increased Revenue.

In this year's revenue account the gross amount received from dividends and interest on investments is £60,325, being some £4,200 in excess of the preceding year. Other income (including Directors' fees of £8,549), less expenses, is £13,439, which is slightly lower than the preceding year. On the debit side of revenue account the principal change is an increase of £2,359 in the amount required for income-tax and National Defence Contribution. The balance carried to appropriation account is £2,077 greater at £49,601.

Dividends Recommended.

The dividends now recommended are as follows:—On the Ordinary shares dividends at the rate of 5½% per annum, less tax at 5s. 6d. in the pound, for the year, or for the period for which they rank for dividend, and on the Deferred shares a dividend for the year of 6%, less tax. These are at the same rates as were paid last year.

In commenting on these accounts I might again refer to the fact that the cost of acquisition of subsidiary companies and expenses of issue of capital have been wholly written off, a practice which we have maintained consistently since the company was formed. At the end of the balance-sheet you will note that the Corporation has given guarantees up to £41,000 in respect of bank overdrafts of subsidiary companies, which at present amount to £38,879. In that connexion I should explain that our general policy is to aid our subsidiary companies to borrow their requirements at the lowest possible rates direct from their bankers rather than making direct loans to them. All of our subsidiaries are thus enabled to effect savings in interest account which in the aggregate amount to a substantial sum. This is one of the benefits which subsidiary companies derive from affiliation with our organization.

New Acquisitions.

The first subsidiary company acquired during the year under review was the Shrewsbury Gas Light Company, which from its geographical position is an important addition to the group. It is also a particularly sound company and has been ably managed for a number of years by Mr. C. M. D. Belton, as Engineer, Secretary, and Manager. The Nantwich Gas Special Order, 1938, was made on Dec. 21, 1938, and the gas undertaking of the Nantwich Urban District Council was transferred by that Order to the Nantwich Gas Company, Ltd., on Jan. 1, 1939. This Company is a wholly owned subsidiary.

During the course of the year steady improvement has been made in the works and distribution system of all the companies in our group. Inadequate and uneconomical plant has been replaced by the latest type of gas producing machinery. In future years the consumers and the companies themselves will benefit from the added efficiency accruing from these improvements.

Whenever it is practicable and economically sound, we are extending our mains to outlying districts and, with this object in view, the Wellington (Salop) Gas Company has applied for an Order from the Board of Trade to authorize the purchase of the neighbouring gas undertaking of Messrs. C. and W. Walker, Ltd., at Lilleshall.

Last year I informed you that the Newport Company had obtained a bulk supply of coke-oven gas and had ceased to manufacture its own gas. This development has proved most satisfactory. Not only have we been able to reduce the price of gas to consumers in that area, but we have, at the same time, improved the quality sent out. As a considerable quantity of additional gas is available at the coke ovens, we have laid a main from Newport to our Company at Chepstow, where the works were closed down on April 6.

Sales of Gas Maintained.

Speaking generally, the year 1938 was an unfavourable year for the Gas Industry. In these circumstances it is gratifying to report that throughout the group as a whole sales of gas have been fully maintained, decreases in some companies being more than offset by increases elsewhere. Last year I reported that total sales of the group amounted to 2,550 million cu.ft. of gas. The total sales of the same companies for the past year show a small increase, and the additions to the group bring the total sales up to 2,994 million cu.ft.

During the year 1938 the burden of increased costs, not only of coal but generally in operating expenses, made itself felt very heavily. In some instances it was necessary to increase the cost of gas to consumers to offset to some extent these increased costs. A number of our companies, however, avoided making an increased charge to their consumers, and some have actually recorded reductions during 1938 and are now selling gas to domestic users more cheaply than in 1935. One of our largest companies had been recording decreased sales for a long period of years before we acquired control, but the trend has now been reversed and increased sales were recorded last year after general price reductions had been put into force. I might add that this has not been achieved at the expense of profits available for distribution.

Among our smaller companies we are also able to record satisfactory progress. In one case, gas sales during 1938 showed an increase of 15½% and in another case they were no less than 25%. Of these two companies, the former had considerably increased its net profit without raising its prices, and the latter, while maintaining its profit, had reduced its charges by approximately 8%. In the aggregate, throughout the Group, in spite of the adverse conditions already referred to, dividends were fully maintained. Our sales of gas appliances again show an increase on preceding years, and the number of our consumers has increased to a new high level.

It is worth recording that considerable progress has been made in regard to street lighting, while domestic lighting by gas is far more popular in provincial towns than many people realise. In the Wellington area alone no less than 4,000 gas lighting switches have been installed, and one of our subsidiary companies in Gloucestershire has fitted in the last six years nearly 20,000 lighting units.

New Gas-Operated Radio.

The demand for a mains supply of electricity for a wireless set has frequently been a factor in the ousting of domestic gas lighting, but recent developments appear to have made it possible to obtain first-class wireless reception by means of an appliance operated entirely by gas. This requires no electric supply and the possibility of a new gas appliance of this character is of great potential interest to the Gas Industry. We are watching this development closely.

We are making every endeavour to increase the consumption of gas per consumer, which throughout the Gas Industry owing to various causes has tended to decline for the past few years, and to that end a number of our companies have adopted two-part tariffs which we are confident will make a strong appeal to discriminating householders.

Pension Scheme for Employees.

I am glad to announce that a pension scheme has been brought into force for the benefit of all employees of our subsidiary companies. I am sure that the shareholders of this Corporation will approve of the steps we have taken to safeguard the livelihood of our staff when their health begins to fail and the time of their retirement arrives. Without the enthusiasm and co-operation of our employees we are unable to produce the best results and I must take this opportunity to thank both the officials and employees of the controlled companies for the manner in which they have served us during the year.

The report and accounts were unanimously adopted and the proceedings terminated with a hearty vote of thanks to the Chairman.

TRADE NEWS

A.R.P. Gas-Heated Boiler.

This decontamination boiler by Radiation, Ltd., embodies many interesting features and has been specially designed to conform to the standards put forward by the Government and local Air Raid Precaution Authorities. It has been introduced for the purpose of washing all kinds of clothing, boots, gloves, and all wearing apparel subjected to the contamination of wartime gases.

A.R.P. Boiler.

Complete decontamination of all garments is provided for by the inclusion of a special grid fitted to the inside of the lid which ensures that the clothes are totally submerged during the boiling operation. All the fumes and steam arising from the washing are automatically directed through the flue outlet.

The boiler is absolutely steamproof when in use, all joints being made with heavy section rubber, and the lid which is hinged and weighted is held perfectly steamtight by the two handlocking wheels.

Apart from its many uses as an A.R.P. boiler it can be used continually for supplying boiling water for floor cleaning, yard-washing, and similar purposes. Provision is made for alternative or supplementary heating from low-pressure steam supply when available.

Particular attention has been given to constructional detail and only materials capable of withstanding hard and continual wear have been used. Rigidly built of cast-iron construction, this heavy duty appliance will be found to give exceptionally good performance and will remain in serviceable condition for an indefinite period.

Different types of counterbalance gear for the lid are available to suit local conditions.

Below are set out the main specifications:

No. of Boiler.	Capacity.	Overall Dimensions. Height.	Dia.	Size of Gas Connexion.	Diameter of Flue Outlet.	Draw-off Tap.
	Gallons.	In.		In.	In.	In.
A.R.P. 1963 ..	30	36½	34½	1¼	5	1
A.R.P. 1967 ..	40	38	36½	1¼	5	1¼

Scaling and Preventing Rust.

"Rust-Oleum" is manufactured for scientific rust control. It is stated to be a positive rust-preventing paint which decorates as it protects and to be suitable for all surfaces. It can be applied over rust and any other paints and is claimed to go twice as far as other paints and last twice as long. "Rust-Oleum" is a special processed paint—a combination of various oils and pigments of the highest quality, specially treated and blended. It does not contain linseed or asphaltum oils, it is a rust preventative and preservative of all metals, arresting the action of rust by excluding all moisture and air. This is accomplished because the action of "Rust-Oleum" when applied fuses with the rust and old paint, drying and forming a firm but flexible surface which contracts and expands with temperature variations. The distributors for England and Wales are Messrs. Stedall & Co., Ltd., Broad Street House, 164, High Holborn, London, W.C. 1.

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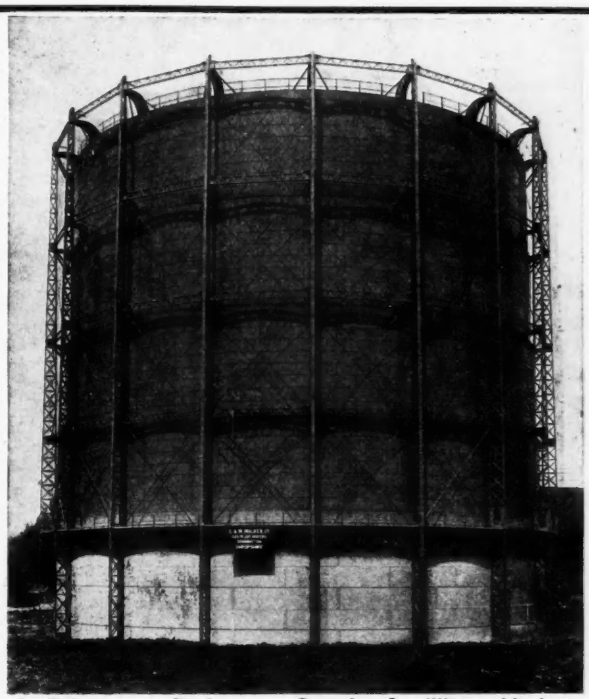

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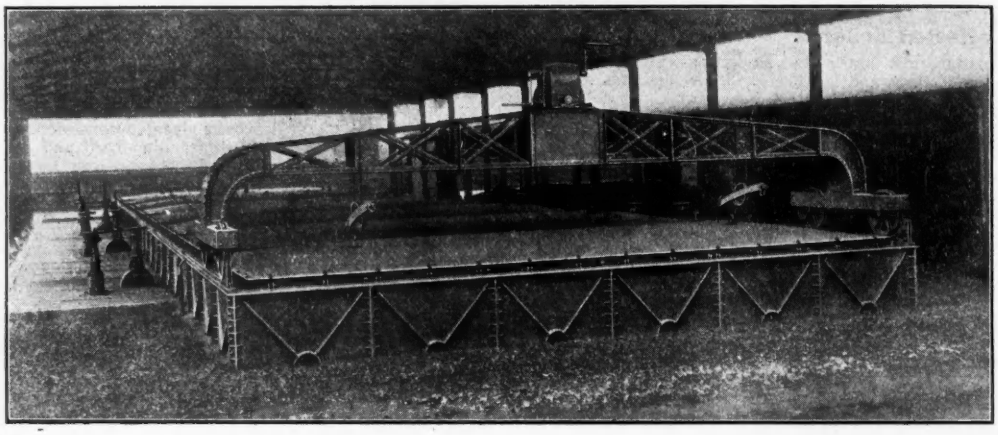

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Equipment - - - - Steel Constructional Work

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Markets and Manufactures

Current Sales of Gas Products

The London Market

May 8.

The present values of Tar Products in London are as under:

Pitch, nominal, at about 26s. to 27s. per ton f.o.b.

Creosote, about 3½d. to 3¾d.

Refined tar, 3¼d.

Pure toluole, about 2s. 4d.

Pure benzole, about 1s. 9d.

95/160 solvent naphtha, 1s. 7d. to 1s. 8d.

90/160 pyridine, about 11s.

All per gallon naked at makers' works.

The Provinces

May 8.

Crude Gas-Works Tar, 12s. to 17s.

To avoid misunderstanding, it is necessary to state that the above price is not claimed to represent a market value. It is a price worked out from week to week upon a system which has been used for many years as a basis for the fixing of certain contracts for crude tar of varying qualities in different areas.

The average prices of gas-works products during the week were: Pitch—East Coast, 27s. to 28s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 27s. to 28s.* Toluole, naked, North, 1s. 10d. to 1s. 11d. Coal tar, crude naphtha, in bulk, North 7¾d. to 8¼d. Solvent naphtha, naked, North, 1s. 4¼d. to 1s. 5d. Heavy naphtha, North, 1s. 2¼d. to 1s. 3d. Creosote, *ex* works, in bulk, North, liquid and salty, 3¾d. to 4¼d.; low gravity, 4d. to 4¼d. Carbolic acid, 60's, 1s. 7d. to 1s. 10d. Naphthalene, £13 10s. to £16. Salts, 70s. to 75s., bags included. Anthracene, "A" quality, 4¼d. to 4½d. per minimum 40% purely nominal; "B" quality unsaleable. Heavy oil: Unfiltered anthracene oil, min. gr. 1,080, 4¾d. to 4¾d; filtered anthracene oil, min. gr. 1,080, 5¼d. to 5½d.; heavy tar oil, gr. less than 1,080, 4¼d. to 4¼d.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls, whatever they may be.

Scotland

GLASGOW, *May* 6.

While home trade has maintained the slight improvement previously reported, the general position is still far from satisfactory. Prices remain somewhat erratic.

Crude gas-works tar.—The actual value is about 30s. to 31s. per ton *ex* works in bulk.

Pitch of vertical quality is valued at 20s. to 21s. per ton f.o.b. for export and round 20s. per ton *ex* works in bulk for home trade.

Refined tar.—Price in the home market is held at 3¾d. to 4d. per gallon, while for export supplies can be secured at about 2¾d. to 3d. per gallon, both into buyers' packages at makers' works.

Creosote oil.—A small but steady business is being conducted in most grades with prices maintained as under: Specification oil, 3¼d. to 3¾d. per gallon; low gravity, 4¼d. to 4½d. per gallon; neutral oil, 3¾d. to 4d. per gallon; all *ex* works in bulk.

Cresylic acid shows no alteration with production being kept at a minimum. Quotations are as follows: Pale, 97/99%, 1s. 2d. to 1s. 3d. per gallon; dark, 97/99%, 1s. to 1s. 1d. per gallon; pale, 99/100%, 1s. 4d. to 1s. 7d. per gallon; all *ex* works in buyers' packages.

Crude naphtha is in small supply but readily commands round 5½d. to 6d. per gallon *ex* works in bulk, according to quality.

Solvent naphtha.—90/160 grade is 1s. 3¼d. to 1s. 4d. per gallon and 90/190 heavy naphtha is about 1s. 1d. to 1s. 1½d. per gallon.

Motor benzole is 1s. 3d. to 1s. 4d. per gallon.

Pyridine.—90/160 grade is 8s. 6d. to 9s. 6d. per gallon and 90/140 grade is 9s. 6d. to 10s. 6d. per gallon.

Benzole Prices

These are considered to be the market prices for benzole at the present time:

	s.	d.		s.	d.	
Crude benzole..	0	9½	to	0	10	per gall. at works
Motor " ..	1	3	"	1	3½	" " "
90% " ..	1	4	"	1	4½	" " "
Pure " ..	1	8	"	1	8½	" " "

Contracts Advertised To-Day

Coal.
Lurgan Gas Department. [p. 426.]
Padiham Gas Department. [p. 425.]
Skipton Gas Department. [p. 426.]
Stockport Gas Department. [p. 426.]

Resetting Retorts.
Brighouse Gas Department. [p. 426.]

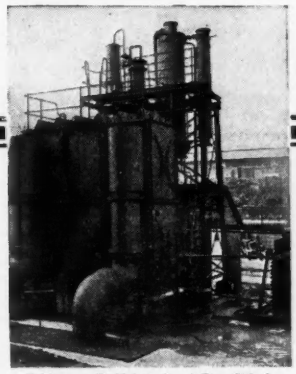
Stores.
Leeds Gas Department. [p. 426.]
Rhyl Gas Department. [p. 425.]

Washer Scrubber.
Pontefract Gas Department. [p. 425.]

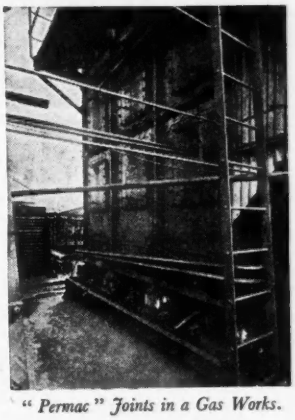
Dividend Announcement

Imperial Continental Gas Association.—The Board of the Imperial Continental Gas Association have resolved that, subject to the approval of the Proprietors and the verification of the accounts by the Auditors, a final ordinary dividend on the £5,600,000 capital stock be paid on June 3, 1939, for the year ended March 31, 1939, to Proprietors registered in the books at the close of business on May 11, 1939, at the rate of 6% (actual), less income-tax at 5s. 6d. in the £, making with the interim dividend of 4% (actual), less income-tax, paid on Nov. 15, 1938, a dividend at the rate of 10%, less tax, for the year. The net profit for 1938-39 is £415,786, against £427,686 for 1937-38.

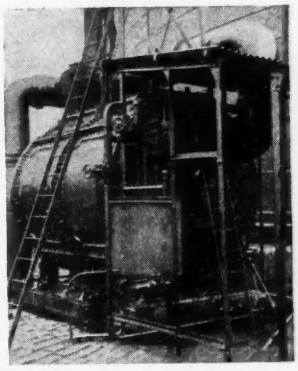
The General Meeting will be held at Winchester House, Old Broad Street, E.C. 2, at 2.15 p.m. on Friday, June 2, 1939.



"Permac" Joints in a Gas Works.



"Permac" Joints in a Gas Works.



"Permac" Joints in a Gas Work.

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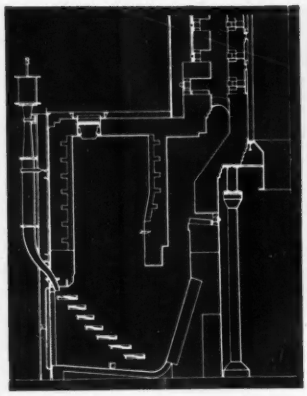

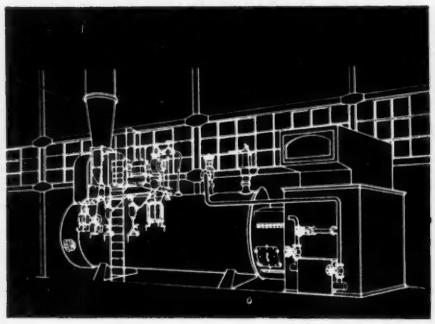

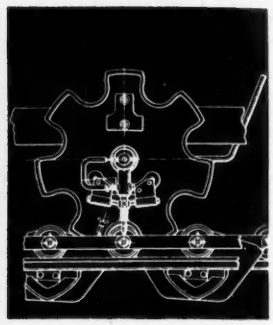

FOR THE RETORT HOUSE

Fuel-gas generation in pressure-operated producers; steam-raising by waste-heat recovery; and automatic force-feed lubrication applied to coal and coke conveyors are amongst the standard features of the modern Glover-West vertical retort installation.

WEST'S

CARBONIZING PLANTS

***Blackpool's new carbonizing plant will be* GLOVER-WEST VERTICALS**

WORK is proceeding on a 72-retort installation of Glover-West vertical retorts at the new Marton gas works for the Blackpool Corporation Gas Department. The plant will be equipped with pressure type producers, waste-heat boilers, dust extraction and air-conditioning plants, together with extensive coaling equipment and coke handling, cutting, grading and de-dusting units. The drawing shows the architectural design of the retort house and coke plant.

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435 INSTALLATIONS BUILT OR ORDERED IN 24 COUNTRIES

GAS STOCKS AND SHARES

Markets opened quietly last week and were again under the influence of the usual changes in the European situation. Business began to look up on Wednesday, reacted on Thursday on M. Litvinov's resignation, but brightened again towards the close after Colonel Beck's speech in reply to the German Chancellor. Gilt-edged stocks speedily recovered their losses and closed fractionally higher, while home rails, assisted by better traffic returns, made heavier advances than for some time past. Industrials also made a good show and the majority of price movements were in an upward direction.

During the past few weeks Gas stocks and shares with few exceptions have depreciated very considerably. In some directions the markings down would appear altogether too drastic, and yet further heavy falls occurred again last week. To quote just a few, Plymouth and Stonehouse closed no less than 22 points lower at 113, business being recorded at 109 during the week. Tottenham fell a further 8 points to 107; East Surrey dropped a similar amount to 107½; Watford and St. Albans closed 10 points lower at 115, and it will be seen in the List below that a number of other stocks suffered further losses. Gas Light units were the only gas securities to make any headway, and following a rise of 9d. the previous week advanced another 3d. to 21s. Yields on "ordinaries" at current prices are therefore exceptionally high, and range from about 4½% (Bristol) to nearly 9% (Imperial Continental).

The Imperial Continental Gas Association are recommending a final ordinary dividend of 6% for 1937-38, again making 10% for the year. The net profit was slightly lower at £415,786, compared with £427,686. As mentioned above, the yield on the ordinary stock, which is available at 112, works out at £8 18s. 6d.%, and at the time of writing it is still *cum div.*

Another report published last week was that of the United Kingdom Gas Corporation, Ltd. In this case the net revenue for 1938 increased from £110,188 to £128,937. The Directors recommend a final ordinary dividend of 3%, making 5% for the year (the same), leaving £13,276 to be carried forward. The total issued share and loan capital at the end of the year was £4,816,812 compared with £4,265,693 at the end of 1937. The £1 shares are available at about 17s. to yield £5 17s. 6d.%.

Official Quotations on the London Stock Exchange

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations May 5.	Rise or Fall on Week.
1,767,439	Mar. 6	8	8	Alliance & Dublin Ord. ...	130—140	...
374,000	Dec. 19	4	4	Do. 4 p.c. Deb. ...	90—95	...
734,733	Nov. 7	5	5	Asscd. Gas & Water U'd'ts Ord.	17/—19/-	...
500,000	,,	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	19/—21/-	...
444,389	,,	4	4	Do. 4 p.c. Red. Cum. Pref.	19/—21/-	...
296,523	,,	4	4	Do. 4 p.c. Irred. Cum. Pref.	16/—18/-	...
500,000	Mar. 6	3½	3½	Do. 3⅞ p.c. Red. Deb. ...	92—97	...
560,070	Feb. 20	7	7	Barnet Ord. 7 p.c.	155—160	...
300,000	Apl. 6	1/4½	1/9⅜	Bombay, Ltd.	17/—20/-	...
181,185	Feb. 20	9½	9½	Bournemouth sliding scale ...	192—202	...
690,526	,,	7	7	Do. 7 p.c. max. ...	153—158	...
493,960	,,	6	6	Do. 6 p.c. Pref. ...	127—132	...
50,000	Dec. 19	3	3	Do. 3 p.c. Deb. ...	70—75	...
362,025	,,	4	4	Do. 4 p.c. Deb. ...	95—100	...
335,000	,,	5	5	Do. 5 p.c. Deb. ...	110—115	...
357,900	Feb. 20	7½	7½	Brighton, &c., 6 p.c. Con. ...	135—140	...
659,955	,,	6⅔	6⅔	Do. 5 p.c. Con. ...	118—123	—2
205,500	,,	6	6	Do. 6 p.c. 'B' Pref.	120—125	...
855,000	Mar. 20	7	8	British Ord.	110—120	—5
100,000	Dec. 19	7	7	Do. 7 p.c. Pref.	138—143	...
350,000	,,	5⅓	5⅓	Do. 5⅓ p.c. 'B' Cum. Pref.	110—115	...
120,000	,,	4	4	Do. 4 p.c. Red. Deb. ...	93—98	...
450,000	,,	5	5	Do. 5 p.c. Red. Deb. ...	100—105	...
450,000	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—95	...
100,000	22May'33	6	4	Cape Town, Ltd.	¼—1¼	—⅛
100,000	6 Nov.'33	4½	4½	Do. 4½ p.c. Pref. ...	1—2	...
150,000	Dec. 19	4½	4½	Do. 4½ p.c. Deb. ...	60—70	...
626,860	Feb. 6	6	6	Cardiff Con. Ord.	112—117	—1
237,860	Dec. 19	5	5	Do. 5 p.c. Red. Deb. ...	103—108	...
98,936	Mar. 20	2/-	2/-	Colombo Ord.	1⅞—1⅞	—$\frac{3}{16}$
24,510	,,	1/4½	1/4½	Do. 7 p.c. Pref. ...	22/—24/-	...
739,453	Mar. 20	-/11·48	-/11·48	Colonial Gas Assn. Ltd. Ord.	16/—18/-	...
296,144	,,	1/3·30	1/3·30	Do. 8 p.c. Pref. ...	23/—25/-	...
1,775,005	Jan. 23	5	4	Commercial Ord.	45—55	—3
140,000	Feb. 6	§13/4	4	Do. 4 p.c. Red. Pref. ...	95—100	...
620,000	Dec. 5	3	3	Do. 3 p.c. Deb. ...	60—65	...
286,344	Feb. 20	5	5	Do. 5 p.c. Deb. ...	103—108	...
200,000	,,	6⅔	4	Do. 3⅞ p.c. Red. Deb. ...	95—100	...
807,560	Feb. 20	7	7	Croydon sliding scale ...	123—128	...
644,590	,,	5	5	Do. max. div.	93—98	—1
620,385	Dec. 19	5	5	Do. 5 p.c. Deb. ...	108—113	...
239,000	Feb. 6	5	5	East Hull Ord. 5 p.c.	88—93	—2
187,215	Feb. 6	6	6	East Surrey Ord. 5 p.c. ...	105—110	—8
176,211	Dec. 5	5	5	Do. 5 p.c. Deb. ...	107—112	—3
250,000	Nov. 7	8	4	Gas Consolidation Ord. 'B' ...	19/—21/-	...
250,000	,,	4	4	Do. 4 p.c. Red. Cum. Pref.	17/6—19/6	...
19,189,963	Feb. 6	5⅔	5⅔	Gas Light & Coke Ord. ...	20/6—21/6a	+—/3
2,600,000	,,	3½	3½	Do. 3½ p.c. max. ...	68—73	—1½
4,477,106	,,	4	4	Do. 4 p.c. Con. Pref. ...	87—92	...
2,993,000	Jan. 9	3⅜	3⅜	Do. 3⅜ p.c. Red. Pref. ...	92—97	...
8,602,497	Nov. 21	3	3	Do. 3 p.c. Con. Deb. ...	68—73	...
3,642,770	,,	5	5	Do. 5 p.c. Red. Deb. ...	105—110	...
3,500,000	,,	4⅛	4⅛	Do. 4⅛ p.c. Red. Deb. ...	101—106	...
700,000	Mar. 6	3⅜	3⅜	Do. 3⅜ p.c. Red. Deb. ...	90—95	...
270,466	Feb. 20	6	6	Harrogate New Cons. ...	105—115	—7½
157,500	Mar. 20	‡1/-	‡1/-	Hong Kong and China Ord. ...	⅝—¾	...
213,200	Feb. 6	5⅜	6	Hornsey Con. 3½ p.c.	97—102	...
5,600,000	Oct. 24	12	8	Imperial Continental Cap. ...	107—112	...
172,810	Jan. 23	3½	3½	Do. 3½ p.c. Red. Deb. ...	87—92	...
235,242	Mar. 6	8½	8½	Lea Bridge 5 p.c. Ord. ...	145—155	...
63,480	Dec. 19	3	3	Maidstone 3 p.c. Deb. ...	58—63	—5
45,000	Nov. 21	†10	†10	Malta & Mediterranean ... Metropolitan (of Melbourne)	130—135	...
392,000	Apl. 6	5½	5½	5½ p.c. Red. Deb.	98—103	...
231,977	Feb. 20	5	5	M.S. Utility 'C' Cons. ...	95—100	—1
968,658	,,	4	4	Do. 4 p.c. Cons. Pref. ...	83—88	...
390,076	Dec. 19	4	4	M.S. Utility 4 p.c. Deb. ...	90—95	...
148,955	,,	5	5	Do. 5 p.c. Deb. ...	107—112	...
125,000	Jan. 3	3½	3½	Do. 3½ p.c. Red. Bds.	94—97	...
675,000	Nov. 21	†6	†6	Montevideo, Ltd.	65—70	...
250,000	Mar. 6	7⅛	7⅛	North Middlesex 6 p.c. Con.	135—140	—5
396,160	Feb. 6	5	5	Northampton 5 p.c. max. ...	103—108	...
300,000	April 24	†9	†7	Oriental, Ltd.	135—145*	—4½
468,537	Dec. 5	8	7⅜	Plymouth & Stonehouse 5 p.c.	108—118	—22
621,667	Feb. 20	8½	8½	Portsmouth & Gosport Cons.	145—155	...
241,446	,,	5	5	Do. 5 p.c. max. ...	98—103	...
73,350	,,	5	5	Do. 5 p.c. Pref. ...	102—107	...
75,000	,,	4	4	Do. 4 p.c. Pref. ...	82—87	...
114,000	Feb. 6	5	5	Preston 5 p.c. Pref.	102—107	—3
247,966	Dec. 19	4	4	Primitiva 4 p.c. Cons. Deb. ...	96—101	...
625,959	Jan. 9	4	4	Do. 4 p.c. Red. Deb. ...	94—99	...
15,000	Mar. 6	6	6	San Paulo 6 p.c. Cum. Pref. ...	8—9	...
441,275	Sept. 19	1/1⅛	1/1⅛	Severn Val. Gas Cor. Ld. Ord.	20/6—22/6	...
460,810	Mar. 20	-/10⅛	-/10⅛	,, ,, 4½ p.c. Cum. Pref.	19/—21/-	...
133,201	Mar. 6	8½	5	Shrewsbury 5 p.c. Ord. ...	141—146	...
9,000	June 3	4	‡4	South African Ord.	4⅛—5⅛	...
1,371,752	April 24	1/2⅜	1/2⅜	South East'n Gas Cn. Ld. Ord.	20/6—22/6*	...
871,636	Mar. 6	-/10⅜	-/10⅜	Do. 4½ p.c. Red. Cum. Pref.	19/—21/-	...
498,818	,,	4	4	Do. 4 p.c. Cum. Pref. ...	17/—19/-	...
450,000	Feb. 6	4	4	Do. 4 p.c. Deb.	95—100	...
150,000	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—95	...
6,709,895	Feb. 6	5	6	South Met. Ord.	81—86	...
1,135,812	,,	6	6	Do. 6 p.c. Irred. Pref. ...	118—123	...
850,000	,,	4	4	Do. 4 p.c. Irred. Pref. ...	85—90	...
1,895,445	Dec. 19	3	3	Do. 3 p.c. Deb.	67—72	...
1,000,000	Jan. 9	5	5	Do. 5 p.c. Red. Deb. ...	104—108	...
600,000	,,	§31/-	3⅜	Do. 3⅜ p.c. Red. Deb. ...	93—98	...
1,543,795	Jan. 23	6	6	South Suburban Ord. 5 p.c. ...	100—110	...
512,825	,,	5	5	Do. 5 p.c. Pref.	103—108	...
500,000	,,	4	4	Do. 4 p.c. Pref.	83—88	...
250,000	,,	3⅜	3⅜	Do. 3⅜ p.c. Red. Pref. ...	90—95	...
888,587	Dec. 5	5	5	Do. 5 p.c. Deb.	107—112	...
250,000	,,	4	4	Do. 4 p.c. Deb.	90—95	...
200,000	Feb. 6	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—95	...
427,859	Apl. 6	9⅜	1/2⅜	S. Western Gas & Water Ord.	15/6—17/6	...
160,523	Apl. 6	-/10¼	-/10¼	Do. 4½ p.c. Red. Cum. Pf.	18/6—20/6	...
110,000	Dec. 19	4	4	Do. 4 p.c. Red. Deb. ...	93—98	...
750,541	Feb. 6	5	5½	Southampton Ord. 5 p.c. ...	104—109	...
148,836	Dec. 19	4	4	Do. 4 p.c. Deb.	90—95	...
350,000	Feb. 6	5½	5½	Swansea 5½ p.c. Red. Pref. ...	104—109	...
200,000	Dec. 19	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—95	...
1,076,490	Feb. 20	6⅔	6⅔	Tottenham and District Ord.	102—112	—8
409,835	,,	5⅓	5⅓	Do. 5⅓ p.c. Pref.	112—117	...
62,235	,,	5	5	Do. 5 p.c. Pref.	103—108	...
453,380	Dec. 5	4	4	Do. 4 p.c. Deb.	90—95	...
85,701	Jan. 9	6	6	Tuscan 6 p.c. Red. Deb. ...	95—100	...
1,131,550	Aug. 22	6	4	U. Kingdom Gas Cor. Ord. ...	16/—18/-	...
1,051,280	Nov. 7	4½	4½	Do. 4½ p.c. 1st Cum. Pref.	17/—20/-	—1/-
762,241	,,	4	4	Do. 4 p.c. 1st Red. Cum. Pf.	18/—20/-	—-/6
745,263	Dec. 19	4½	4½	Do. 4½ p.c. 2nd Non-Cum. Pf.	14/—16/-	...
1,066,186	Mar. 6	3½	3½	Do. 3½ p.c. Red. Deb.* ...	90—95	...
378,106	Mar. 6	7	7	Uxbridge, &c., 5 p.c.	120—125	...
133,010	,,	5	5	Do. 5 p.c. Pref. ...	102—107	...
1,371,138	Jan. 23	7	7	Wandsworth Consolidated ...	110—120	...
2,525,768	,,	4	4	Do. 4 p.c. Pref. ...	82—87	...
1,343,964	Dec. 19	5	5	Do. 5 p.c. Deb. ...	107—112	...
383,745	,,	4	4	Do. 4 p.c. Deb. ...	90—95	...
400,000	,,	§25/-	3⅜	Do. 3⅜ p.c. Red. Deb. ...	93—98	...
558,342	Feb. 6	6⅔	6⅔	Watford and St. Albans Ord.	110—120	—10
200,000	,,	5	5	Do. 5 p.c. Pref. ...	98—103	—4
200,000	,,	5⅓	5⅓	Do. 5⅓ p.c. Pref. ...	110—115	...
200,000	,,	§16/8	4	Do. 4 p.c. Rd. Pf. (1973/8)	93—98	...
100,000	—	—	—	Do. 4 p.c. Red. Pf. (1959)	97—102	...
200,000	Dec. 19	4	4	Do. 4 p.c. Red. Deb. ...	95—100	...
200,000	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—95	...

a.—The quotation is per £1 of stock. * Ex. div. † Paid free of income-tax. ‡ For year. § Actual.

Supplementary List and Provincial Exchanges overleaf.

STOCK AND SHARE LIST—Cont.

Supplementary List, not Officially Quoted, London

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Nominal Quotations May 5.	Rise or Fall on Week.
202,152	Mar. 20	5	5	Ascot Ord.	99—104	...
128,182	Dec. 19	5	5	Do. 5 p.c. Pref.	102—107	...
31,035	Mar. 20	–/4[f]	–/4[f]	Associated Utilities 4 p.c. Pref.	15/—17/–	...
100,000	Dec. 19	3½	3½	Do. 3½ p.c. Red. Deb. ...	95—100	...
17,000	Feb. 20	8	8	Bognor Orig. Ord. 'A' ...	142—152	...
62,210	,,	8	8	Do. New Addl. 'A' ...	142—152	...
87,160	,,	7	7	Do. New 7 p.c. max. ...	140—150	...
37,440	Feb. 6	10	10	Cam. Univ. & Town 10 p.c. max.	165—175	...
125,970	,,	7	7	Do. 7 p.c. max.	115—125	...
39,025	,,	5	5	Do. 5 p.c. max.	95—100	...
96,410	Feb. 6	4½	4½	Cardiff 4½ p.c. Pref.	93—98	...
150,000	Feb. 20	4	4	Croydon 4 p.c. Pref.	91—96	...
130,000	Dec. 19	4	4	Do. 4 p.c. Deb.	92—97	...
65,000	Mar. 6	7½	7½	Eastbourne 'A' 5 p.c. ...	122—132	...
198,000	,,	6	6⅔	Do. 'B' 3½ p.c.	105—115	...
112,312	,,	5	5	Do. 5 p.c. Pref.	102—107	...
130,000	Dec. 19	5	5	Do. 5 p.c. Deb.	107—112	...
24,000	Feb. 20	8½	8½	Great Yarmouth 8½ p.c. max.	30—35	...
59,400	,,	7½	7½	Do 7½ p.c. max.	27—32	...
51,160	Dec. 5	5½	5½	Do. 5½ p.c. Deb.	117—122	...
152,600	Feb. 20	8	9	Guildford Cons.	150—160	—7½
54,055	,,	5	5	Do. 5 p.c. Pref.	102—107	...
68,250	Dec. 19	5	5	Do. 5 p.c. Deb.	105—110	...
156,600	Feb. 20	7½	7½	Hampton Court Cons. ...	110—120	...
80,000	Mar. 6	4	4	Lea Bridge 4 p.c. Pref. ...	82—87	...
60,000	,,	6	6	Do. 6 p.c. Pref.	118—123	...
94,876	Dec. 5	4	4	Do. 4 p.c. Deb.	87—92	...
73,620	Mar. 6	8½	8½	Luton Cons. 'A'	150—160	...
107,960	Mar. 20	4	5⅛	Mid Kent Ord.	8¼—9½	...
230,940	Feb. 6	10	10	Oxford & District Ord. ...	165—175	...
47,112	,,	5	5	Do. 5 p.c. Pref.	102—107	...
50,000	,,	6	6	Do. 6 p.c. Red. Pref. ...	108—113	...
126,193	Nov. 7	7⅛	7⅛	Peterborough Ord.	137—142	...
64,990	Mar. 6	7⅛	7⅛	Redditch Ord....	115—125	...
166,850	Feb. 6	8	8	Romford Ord....	137—142	...
60,000	,,	4	4	Do. 4 p.c. Pref.	97—102	...
44,000	Mar. 20	5	5	Do. 5 p.c. Deb.	107—112	...
25,570	Feb. 6	5⅛	5⅛	Rugby 5⅛ p.c. Pref.	118—123	...
25,000	,,	6	6	Do. 6 p.c. Red. Pref. ...	103—108	...
42,750	Dec. 5	5⅛	5⅛	Do. 5⅛ p.c. Deb.	115—120	...
110,950	Feb. 20	8	8	Ryde Ord.	137—147	...
270,086	Mar. 20	7	7	Slough Ord.	120—130	...
21,000	Dec. 19	5	5	Do. 5 p.c. Deb.	105—110	...
28,872	Nov. 7	5⅛	5⅛	S. Midland Gas Cpn. Ltd. Ord.	17/—19/–	...
28,866	Mar. 6	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	17/—19/–	...
117,228	Feb. 20	5	7	Swindon Cons.	100—105	...
60,425	Dec. 5	5	5	Do. 5 p.c. Deb.	105—110	...
64,380	Dec. 19	5	5	Torquay & Paignton 5 p.c. Pref.	102—107	...
130,000	Feb. 6	5	8	Wakefield Ord.	116—121	...
81,650	,,	5	5	Do. 5 p.c. max.	92—97	...
82,000	Jan. 23	6	6	Weymouth Ord.	101—106	...
98,384	Feb. 6	6	6	Wolverhampton 6 p.c. Pref.	115—120	...
160,000	Dec. 19	5½	5½	Do. 5½ p.c.Rd.Db.	103—108	...
90,000	Dec. 19	5	5	York 5 p.c. Red. Deb. ...	102—107	...
133,640	Feb. 20	6½	6½	Yorktown (Cam.) 5 p.c. Cons.	115—120	...
120,000	,,	5	5	Do. 5 p.c. Pref.	102—107	...
35,000	Dec. 5	5½	5½	Do. 5½ p.c. Deb.	112—117	...

BRISTOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations May 5.	Rise or Fall on Week.
347,756	Feb. 6	5	6	Bath Cons.	115—117	...
1,667,250	Feb. 6	5	5	Bristol, 5 p.c. max.	105—108	...
120,420	Dec. 19	4	4	Do. 1st 4 p.c. Deb. ...	98—101	...
415,250	,,	4	4	Do. 2nd 4 p.c. Deb. ...	98—101	...
328,790	,,	5	5	Do. 5 p.c. Deb.	115—118	...
274,000	Feb. 20	5	5	Newport (Mon.) 5 p.c. max. ...	95—97	...
13,200	Mar. 20	7	8⅔	Pontyp'l Gas & W. 10 p.c. 'A'	12⅝—13½	...
13,600	,,	6	5	Do. 7 p.c. 'B' ...	11½—12	...
40,000	,,	6	5	Do. 7 p.c. 'C' ...	11½—12	...
140,778	Feb. 6	5	5	Weston-super-Mare Cons. ...	103½—105½	...
64,338	Dec. 19	4	4	Do. 4 p.c. Deb. ...	98—101	...
33,340	,,	7⅛	7⅛	Do. 7⅛ p.c. Deb. ...	149—152	...

LIVERPOOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations May 5.	Rise or Fall on Week.
157,150	Feb. 6	5	6½	Chester 5 p.c. Ord.	107—110	...
92,500	Dec. 19	4	4	Do. 4 p.c. Pref.	95—99	...
36,430	,,	3½	3½	Do. 3½ p.c. Deb.	87—90	...
41,890	,,	4	4	Do. 4 p.c. Red. Deb ...	97—101	...
2,167,410	Feb. 20	6	6	Liverpool 5 p.c. Ord	117—119	...
245,500	Dec. 19	5	5	Do. 5 p.c. Red. Pref. ...	100—105	...
306,083	Jan. 23	4	4	Do. 4 p.c. Deb.... ...	99—101	...
106,280	Feb. 6	10	10	Preston 'A' 10 p.c.	177—187	...
188,219	,,	7	7	Do. 'B' 7 p.c.	129—139	...

NEWCASTLE EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations May 5.	Rise or Fall on Week.
122,577	Feb. 20	8	8	Blyth 5 p.c. Ord.	157½—158½	...
732,000	Feb. 20	3	3	Hartlepool G. & W. Cn. & New	69—71	...
2,061,315	Feb. 6	5	5⅛	Newcastle & Gateshead Con.	20/9–21/3a	...
682,856	,,	4	4	Do. 4 p.c. Pref. ...	89—91	...
776,706	Dec. 19	3½	3½	Do. 3½ p.c. Deb. ...	88—89	...
277,285	April 24	5	5	Do. 5 p.c. Deb. '43 ...	101—103*	...
332,351	Feb. 6	6	6	Sunderland 6 p.c. max. ...	132½—134½	...

NOTTINGHAM EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations May 5.	Rise or Fall on Week.
542,270	Feb. 6	6	9	Derby Con.	132—137	...
55,000	Dec. 19	4	4	Do. 4 p.c. Deb.	100—105	...
20,000	Dec. 19	5	5	Long Eaton 5 p.c. Pref. ...	10—12	...
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